Shipbuilding Ship operation Ship maintenance

MARINE REVIEW

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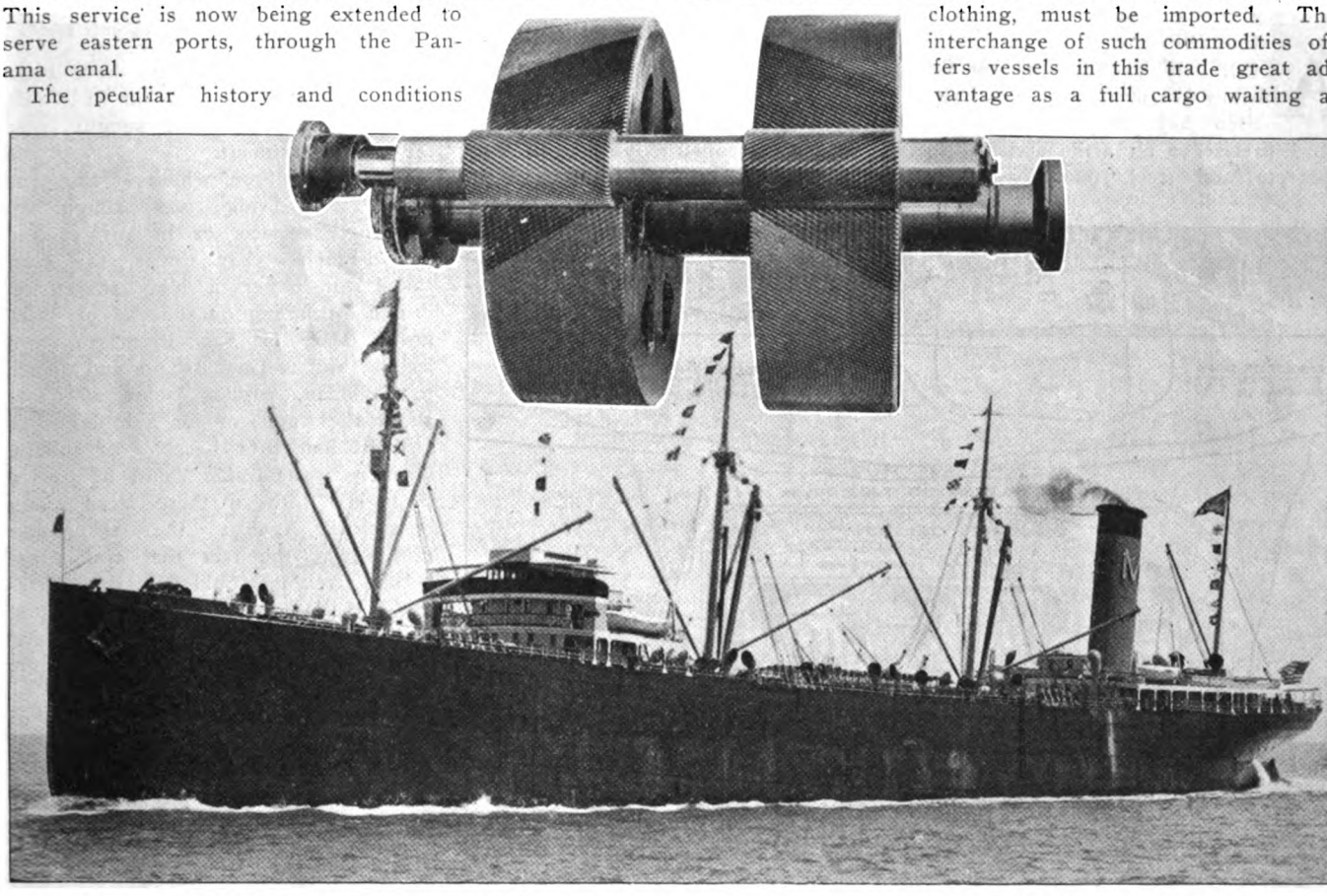
Designs Ship for Hawaii Trade

Pioneer Operator to Pacific Islands Develops Turbine Driven Freighter for Special Service—Engine Room Aft

THE big new steamer MANULANI of the Matson Navigation Co., San Francisco, recently completed her first trip to Atlantic ports. This progressive Pacific coast company was started in 1882, when Capt. William Matson entered the Hawaiian trade with the little 185-ton sailing ship, EMMA CLAUDINA. Now, aside from its smaller coastwise vessels, the company operates 11 large steamers, with a total tonnage of approximately 150,000 tons, in the trade between San Francisco and the Hawaiian islands. This service is now being extended to serve eastern ports, through the Panama canal.

The peculiar history and conditions of the Hawaiian islands is one cause of the success of this company. Cast up from the bottom of the sea less than 800 years ago, this newest inhabited land produces but two crops, sugar cane and pineapple, but it produces these in great abundance. In 1920 the sugar crop amounted to 600,000 tons, while the pineapple crop aggregated 200,000 tons, a supply for the entire Pacific coast.

In return, every article used by the 256,000 inhabitants of the islands, from lumber and fuel to automobiles and clothing, must be imported. The interchange of such commodities offers vessels in this trade great advantage as a full cargo waiting at



NEW FREIGHTER MANULANI OPERATED BY THE MATSON NAVIGATION CO. IN THE HAWAIIAN ISLANDS TRADE. INSET SHOWS A DETAIL VIEW OF HER BIG GEARS

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each end of a trip permits a return voyage just as soon as one cargo can be unloaded and another taken on.

In 1915, the Matson company gave the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., the contract for the propelling equipment for the new passenger and freight steamer MAUI. This vessel, the largest in the Pacific trade, made a number of runs before being commandeered by the navy for war transport service. In this work, she operated under gruelling conditions during the war, and then resumed her transpacific run.

Her performance was such that when the Matson company, released from war time restrictions, embarked on its new policy of expansion and let the contract for two of the finest and most modern freighters in the world, the same type of geared turbines were specified as the propelling equipment.

These vessels, the MANULANI (Bird of Paradise) and MANUKAI (Bird of the Sea) which were built by the Moore Shipbuilding Co., Oakland, Cal., are 497 feet long, and each has a deadweight cargo capacity of 14,000 tons, equivalent to the freight carried by 34 trains of 30 cars each.

Several unusual and interesting features are embodied in the construction of these vessels. The engine room is located aft, leaving the whole space forward clear for cargo. Hatches are unusually large and numerous to facilitate cargo handling.

The double bottoms of the vessels are used to carry fuel oil for the islands on the outbound voyage. This is discharged at the islands, the tanks are rapidly cleaned by high pressure steam jets, and are then refilled with molasses for the return voyage. The masts are hollow and extend down into these tanks, so that they act as relief pipes for the contents of the tanks if expansion occurs or gas is given off.

Besides molasses, the vessels on the return voyage carry sugar and pineapples, the total value of one such cargo being about $1,750,000. Special refrigerating and ventilating systems have been provided to preserve meats and fish, to keep the tropical fruit from sweating and to keep the sugar dry.

On her maiden voyage, the MANULANI broke all Pacific records for freighters when she made the voyage in 6 days, 12 hours and 22 minutes, at an average speed of 13½ knots. Her designed full load speed is 12½ knots.

The machinery which drives each of these vessels consists of one set of Westinghouse 5000 shaft horsepower divided-flow turbines, which drive the propeller through a double-reduction, floating-frame gear. Each step of the reduction is in a separate case, the first reducing the turbine speed 3600 revolutions per minute to 460 and the second, the latter speed to 90 revolutions per minute.

A special feature of the turbines is the impeller-type governor which automatically keeps the propeller from racing when the vessel is light or the screw comes out of water. It operates by means of oil under pressure, the pressure being maintained by a small centrifugal pump mounted on the turbine shaft. This pressure varies directly with the turbine speed to give a sensitive and reliable governor.

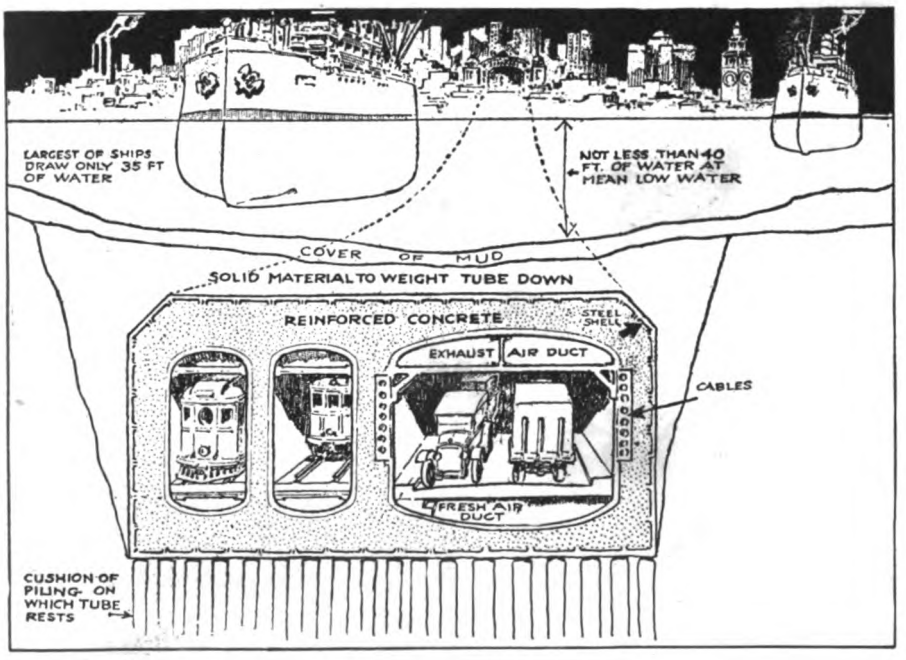
In addition to the propelling equipment, the Westinghouse company also furnished the condensate pumps, ejectors, and the design for the condensors, which had to be specially adapted for using circulating water of high temperatures.

The average consumption of fuel per shaft horsepower hour, on the MANULANI's first round trip was less than a pound of oil, which is an excellent record for this class of vessel.

Plan $40,000,000 San Francisco Bridge

BY H. H. DUNN

A CONCRETE tube sunk 50 feet below the surface of San Francisco bay, and running eastward to rise at an artificial island of concrete and steel, thus leaving to shipping an unobstructed channel 2300 feet wide and 40 feet deep, is one solution of the water-traffic problem offered in the construction of the $40,000,000 passageway across San Francisco bay, for which plans have been drawn, and for the erection of which permission is now being sought from the war department.


LARGEST OF SHIPS DRAW ONLY 35 FT OF WATER
NOT LESS THAN 40 FT. OF WATER AT MEAN LOW WATER
COVER OF MUD
SOLID MATERIAL TO WEIGHT TUBE DOWN
REINFORCED CONCRETE
STEEL SHELL
EXHAUST
AIR DUCT
CABLES
FRESH AIR DUCT
CUSHION OF PILING ON WHICH TUBE RESTS

CROSS SECTION DRAWING OF PROPOSED TUBE UNDER SAN FRANCISCO WATERFRONT DESIGNED TO GIVE A CLEAR CHANNEL 2300 FEET WIDE AND 40 FEET DEEP

For a long time, whenever the proposal for a bridge was brought up in San Francisco, or in any of the San Francisco bay towns, the plan called for either a high suspension bridge, beginning on the top of Telegraph Hill, in San Francisco, and leaping first to Goat Island, and thence to Oakland, passing some 200 feet above the water, or for a bridge with at least four lifts, bascules or rollers, whereby water-traffic could be passed through. Both of these faced many obstacles. Against the suspension bridge was the fact that traffic, especially freight, would not climb Telegraph Hill to reach the bridge. Against the many draws were the numerous and costly delays to vehicular traffic on the bridge.

With the recent engagement of James Vipond Davies, New York, and Ralph Modjeski, Chicago, to make surveys and reports on the practicability of a passageway for land traffic across the bay, both the suspension bridge and the draw bridge were rejected, and waterborne traffic cared for by making the first 3500 feet of the passageway a

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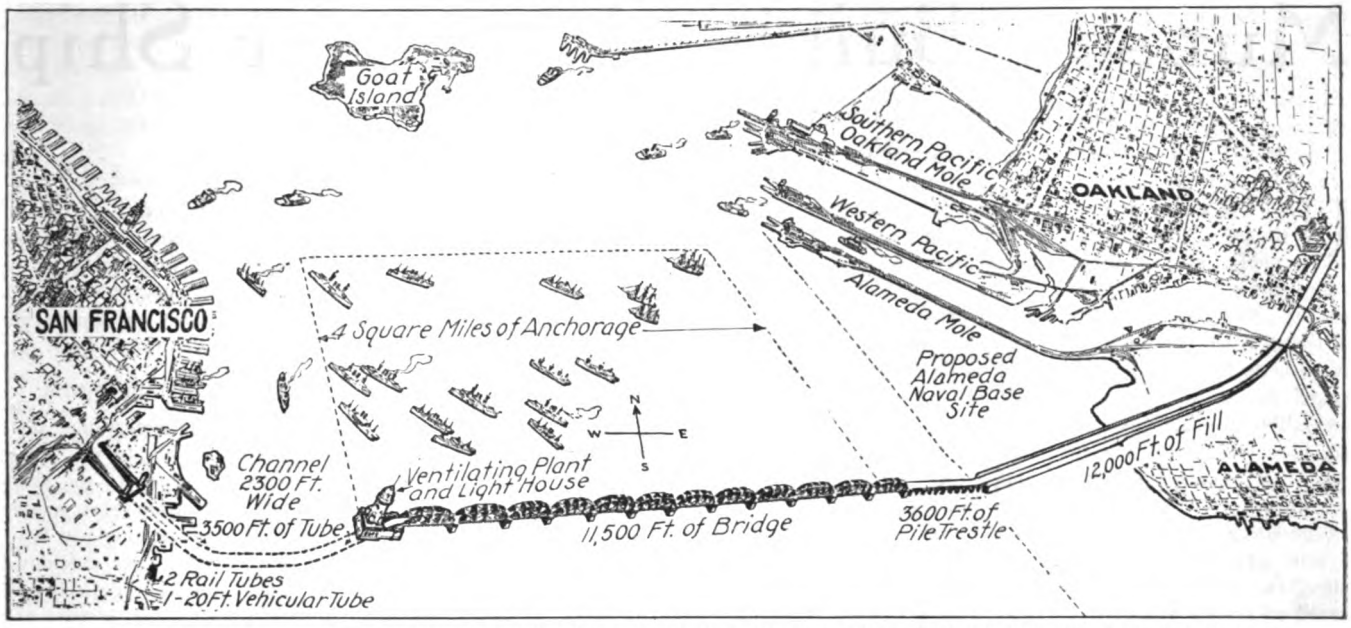

PLAN CALLS FOR $40,000,000 COMBINATION TUBE, BRIDGE, TRESTLE AND MOLE ACROSS SAN FRANCISCO BAY

tube, dipping under the deeper part of the bay, and leaving the waterfront of San Francisco as clear for all shipping as it now is. On the report of these engineers it has been decided to construct the passage in the form of a combined tunnel, bridge, trestle and causeway or mole, running from a point near the Union Iron Works, in South San Francisco, 5.8 miles, almost due east, to a projecting point of land in the city of Alameda.

Starting 800 feet back from the pier-base line in San Francisco, the tube will dip downward until, when it strikes the pierhead line, where there is at mean low tide a depth of 40 feet, it will be 50 feet beneath the surface—40 feet of water, and 10 feet of mud and silt, the bay bottom. The tube maintains this depth for 2300 feet due east, leaving a deep-water channel of this depth and width, ample for all the traffic of San Francisco for years to come, as compared with the channel entrances of other large and important harbors, both in America and in Europe. At the eastern side of this 2300 feet of channel, the tube begins to rise, maintaining an easterly course, and, after 400 feet, comes to the surface on an artificial island. This contains a lighthouse, to mark the outer edge of the channel, and a pumping plant to force air through the tube back toward the San Francisco terminal, where it is to be sucked out by pumps synchronized with those on the island.

The tube is to be either cylindrical, of concrete, lined with steel, and driven with driving heads and shields, or will be a square, reinforced concrete box, dropped into a trench previously dug in the bottom of the bay. The exact type of tube is left to the engineers who do the actual construction. Within the tube will be two passageways, one containing a 20-foot roadway for automotive and other vehicles, and a 5-foot sidewalk, while the other will contain two railroad lines, over which will pass the city and interurban and suburban cars, and such freight and passenger cars from the steam railroads as can be handled by electric engines. Naturally, no steam engines will be allowed in the tube.

At the artificial island above mentioned, starts the bridge proper, which will be of steel, 11,500 feet in length, probably 40 spans of 300 feet each, resting on unusually large and heavy reinforced concrete piers, due to the heavy and constantly changing currents to be found in this part of San Francisco bay. The number and character of these piers, and the method of construction of the island, however, will depend entirely on the results of a survey of the bottom of the bay, and of the currents and the tides, which is now being made.

The bridge will clear about 40 feet above the water, possibly more than this, to give ample room for the movement of power-boats, small tugs, power-freight and passenger carriers and other craft engaged in inland waterways traffic up and down the bay, between the Sacramento and San Joaquin rivers and towns around the southern section of San Francisco bay. There will be no openings in the floor of the bridge, either lifts, draws or rollers, and larger water traffic will be confined to the 2300 foot channel, 40 feet deep, on the western side of the bay. The bridge-floor, however, will be wider than the floor of the tube, allowing for 40 feet of roadway, instead of 20, as in the tube, and four lines of railway, instead of two. This greater width will persist from the artificial island to the eastern terminus of the passage-way.

After the 11,500 feet of steel bridge, will come 3600 feet of trestle, made of cement and steel piers, floored with concrete slabs. This trestle will carry traffic across the shallow waters of the eastern side of the bay, but will be high enough for the passage of small boats, such as power freight and passenger carriers and power tugs which may wish to use the eastern waters of the bay. There will be no openings in the floor of this trestle, and it will be as wide as the bridge proper.

At the eastern end, the trestle runs on to a fill, causeway or mole, 12,000 feet in length, which will carry traffic into the heart of the city of Alameda, and deliver it to the wide paved thoroughfares which run northward to Oakland, Emeryville, Berkeley, Richmond and on into the interior of northern California, and southward to San Jose, and on to all the towns of the state lying to the south of the bay. The fill is to be made of rip-rap rock work, filled with material dredged from the bottom of the bay, and floored with gravel and shells. It will be considerably wider than either bridge or trestle, and will be ornamented with flowers, and probably have pleasure piers running out from it into the deeper water created by the dredging necessary to make the mole. This fill also will afford protection from the south to the proposed naval base at Alameda, which lies just to the north of the causeway.

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Munson Builds Passenger Ship

Old Established Line Constructs Big Vessel for Latin-American Services—For Cuban and South American Runs

UNUSUALLY excellent accommodations will be offered the traveling public aboard the new passenger and freight ship MUNARGO, constructed by the New York Shipbuilding Corp., Camden, N. J., for the Munson Steamship Lines, New York. This vessel is designed primarily for the Cuban service, but unlike all other vessels in that service, has three classes of passenger accommodations. She has unusual speed and a record capacity. The Munson line owns one passenger boat, the MUNAMAR, which is now operated in trade between Cuba and New York. The MUNARGO is expected to supplement that boat and, whenever the necessity arises, can be diverted to the New York-Buenos Aires services of the company. The speed will be ample for the latter service and the ship has a steaming radius which will make it possible to operate her in the South American run without refueling.

Designed for Special Trade

The new ship is 432 feet 3 inches in length over all, and has a displacement tonnage of more than 10,000 tons. She will burn oil and has a single screw but her guaranteed minimum speed is 16½ knots. Under favorable conditions, she is expected to speed up to 20 knots. The Munson line designed the MUNARGO with the special demands of the trade in mind, a thorough knowledge of these demands having been obtained through many years of experience. The ship will have accommodations for 172 first class passengers, 56 second class and 50 steerage. Furthermore, she will have a cargo capacity of 299,060 cubic feet of bale space or 325,000 cubic feet of grain space. A limited amount of cargo space has been equipped with refrigeration to accommodate perishable cargo, and some of the bottom tanks have been fitted to carry molasses.

A vessel of such special construction is expected to offer considerable revenue possibilities. And the ability to interchange her from one run to another is a further insurance of her possibilities. The ship was designed for the Munson Steamship Lines by Theodore E. Ferris, naval architect, New York. Although careful consideration has been given her freight-earning possibilities, the passenger accommodations have not been overlooked. Special attention has been given to the design and decoration of the music room, library, smoking room and deck veranda. There will be special suites in the first class quarters which will be equipped with every luxury. These suites are finished in precious woods, including red mahogany, white mahogany and walnut. Others of the special rooms will have a paint finish in special colorings conforming to the general decorations.

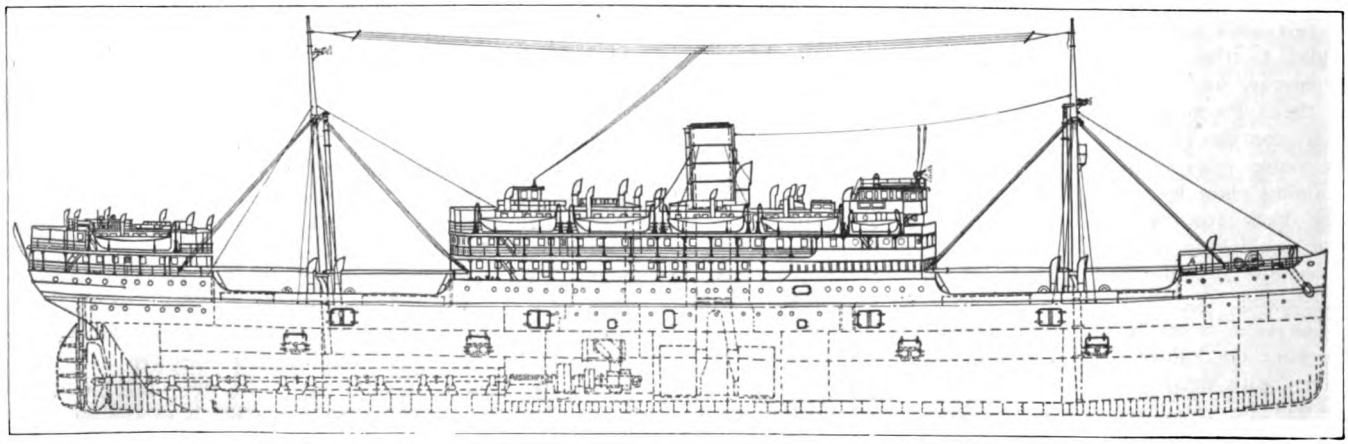
The MUNARGO is of the 3-deck, shelter deck type, with forecastle, long bridge and poop, single screw, with complete double bottom. She has second, upper, shelter and bridge decks. The forecastle and poop decks are completely plated, while the promenade and boat decks are partially plated. The poop bridge and promenade and boat decks have caulked deck outside of the houses. The forecastle deck has a caulked wood deck. The ship has an elliptical stern, and a stem raked forward. She has two steel pole masts, fitted with cargo derricks, and one smokestack. There are four cargo hatches through the shelter, upper and second decks and one blind hatch at the after end of No. 2 hold through the upper and second decks. Four cargo ports are located between the second and upper decks, and four cargo ports between the upper and shelter decks on each side. Also there are two coaling ports, one stowing port and one ventilating port on each side, between the upper and shelter decks, and one vent port on each side between the shelter and bridge decks.

Ample Bulkhead Arrangements

The ship has seven watertight steel bulkheads, six extending up to the upper deck, and collision bulkheads to the shelter deck forming eight transverse watertight compartments. The engine and boiler enclosures are built of steel extending to above the top of the boat deck house. All the superstructure deck houses are built of steel with the exception of the wheel and chart house and wireless house, which are finished outside in teak.

The cargo holds, second and upper 'tween decks will be used for cargo. On the upper deck amidships will be the crew's quarters, baggage and mail rooms, first-class galley, storerooms, messrooms, cold storage, etc. At the after end are the men's and women's steerage, and at the forward end are the stores. The superstructure amidships, including the bridge enclosure, contain staterooms, suites and special staterooms for first-class passengers, vestibules, entrances, social halls, lounge and music room, library, reading and writing room, smoking room, deck verandas, grill room, private and public toilets and baths.

Aft in the poop and poop deck houses are the second-class accommodations, staterooms, toilets, baths, smoking room, lounge and music room with dining saloon on the shelter deck. On the boat deck, aft of the officers' house, is the first-class passenger sun deck and dancing deck. The entire house on the boat deck is arranged for the accommodation of officers and crew with wheel and chart



OUTBOARD PROFILE OF AMERICAN BUILT PASSENGER SHIP FOR LATIN-AMERICAN SERVICE

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house and navigating bridge. Awnings are fitted over the sun deck at the after end of the boat house, aft over the second cabin passengers' deck, over the navigating bridge and over the forecastle deck.

Public Rooms Attractive

In the first class passenger public spaces of the MUNARGO are fitted full height pilasters which are tapered in width and thickness. Both the pilasters and pillars are fluted with tapered fluting. Over the dining saloon in the way of the lounge and music room is a light well. The well opening over the dining saloon is trimmed with mahogany to match the finish of the dining saloon. Above is an ornamental glass dome. From the vestibules to the dining saloon at each side is a stairway leading up to the entrance at the lounge. The newel posts are of mahogany. All the exposed surfaces of the stairways are of mahogany, and the inside finish is in mahogany panel work. The treads of the stairways and landings are covered with tiling. The balustrades are metal grille work. Leading up from the first class lounge and music room is a forward upper stairway of similar design.

The dining saloon is trimmed with mahogany and fitted with ornamental figured glass windows. This room is finished up to the wainscoting line in mahogany with baseboard and large panels with special moldings. Above the wainscoting line are similar large panels finished in ivory paint. White mahogany furniture is installed in the first-class library, writing and reading rooms. Fumed oak is used in the first-class smoking room. The deck veranda is finished in teak.

The first-class suites are finished in mahogany. The inside finish of the entrance doors and the doors to the connecting baths are of mahogany with mahogany door trim. The doors to the bath rooms are fitted with a full length mirror on suite room side. The inside finish of the suite rooms are large panel effects. The beams overhead are capped and ceiling panels fitted. The decorative effect in the suite rooms is obtained by moldings and corner decoration, the rooms being painted in tints and stripping of gold. Each suite is provided with mahogany dressing cabinet, wardrobe with mahogany doors, and the rooms are fitted with twin steel beds finished in mahogany. They are furnished with upholstered chairs with a mahogany night table between the beds.

The propelling machinery consists of geared turbines driving a single screw. There are five single-end Scotch boilers fitted for burning oil fuel arranged in one fireroom, together with the necessary auxiliaries. There is an electric light and power plant, cold storage system, steam winches, steam capstan, steam windlass, steam and auxiliary steering gear, and the other usual equipment for a vessel of this class. The latest type of Parson's double reduction gear steam turbine is installed.

Each one of the five Scotch boilers has an inside diameter of 16 feet 4 inches and is 12 feet 3 inches long over the top heads. They are built for a working pressure of 200 pounds per square inch.

Capacity of Power Equipment

The turbine engine consists of one high pressure ahead and one low pressure ahead turbine in series, each driving a separate pinion by means of double reduction gearing.

The astern turbine in series is arranged in the exhaust ends of both the head turbines, the maximum pressure of the high pressure turbine steam inlet being 190 pounds per square inch, and the maximum pressure at high pressure astern turbine being 150 pounds per square inch. The revolutions of the turbines at full power ahead are as follows: High pressure turbine 2500 revolutions per minute, and low pressure turbine 1800 revolutions per minute, and at these revolutions the turbines develop not less than 5800 shaft horsepower. The speed of the propeller, under these conditions, is 85 revolutions per minute.

Dimensions of New Liner

	Feet	Inches
Length over all	432	3
Length between perpendiculars	414	0
Beam molded	57	6
Depth to shelter deck at side	34	6
Depth to upper deck at side	26	6
Depth to second deck at side	17	9
Designed load draft	23	0

PRINCIPAL DATA

Displacement in sea water at 23 feet molded draft, long tons	10,150
Block coefficient on displacement length of 408 feet	0.658
Designed shaft horsepower at 85 revolutions per minute	5800
Steaming radius at 15½ knots speed, 1910 tons of oil, knots	10,808
Speed at load draft (oil burning), knots	15½
Estimated equipped weight of ship, long tons	5200
Deadweight capacity at 23 feet draft, including cargo, fuel oil, stores, water, passengers, crew and effects, about, long tons	4950
Cargo cubic capacity measured under beams inside of cargo battens, top of ceiling, including hatches, exclusive of allowance for broken stowage:	
Bales, about, cubic feet	299,060
Grain, about, cubic feet	325,000
Fuel oil capacity, including double bottom tanks, deep tanks, peak tanks, figures at 40 cubic feet, 4 per cent deduction for structure and expansion, long tons.	1910
Boiler feed water capacity in double bottom, long tons	182
Culinary water capacity in deep tanks, long tons	238

New Port of New York Has Largest Area

President Harding signed the act giving federal recognition to the newly created Port of New York authority on Aug. 23. The following day the commissioners of this authority had its first official inspection of the port which embraces 771 miles of frontage on the enclosed waters. Members of congress from New York and New Jersey, army engineers and other officials made a tour of the waters about the city on the steamship VISITOR as the guests of the port commissioners. Although the tour occupied the whole day, it was impossible to cover the entire territory. Of the straight waterfront included within the new port of New York, 578 miles are in New York state and 193 in New Jersey. The port's area is 175 square miles, a space in which, according to the port officials, any six of the other leading ports of the world could be placed, with a large area still uncovered. While the port is now handling approximately 45,000,000 tons of water-borne traffic annually, it is expected, when the improvements are completed through the co-operative influence of the two states, the port will be able to accommodate approximately 500,000,000 tons.

Approximately 100 persons made the inspection trip. They included Representatives Charles G. Bond, Anthony J. Griffin, Albert B. Rossdale, Isaac Siegel, Frederick R. Lehrbach, Arch F. Opp, Ben L. Fairchild, Michael J. Horgan, Adolph L. Kleine, J. J. Kindred, J. Frank Appleby and Herbert W. Taylor. At the end of the cruise there was a dinner for the group.

The new district is controlled by a body of commissioners, of which E. H. Outerbridge is chairman. These commissioners are instructed by law to report to the legislatures of the two states the final definite plans for developing the port, which plans, it is understood, will outline the methods to be followed in raising the necessary funds for the trackage, tunneling, and other work which will be necessary to connect the various sections of the port and facilitate the handling of overseas and domestic business.

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Is the Panama Canal Too Small?

Analysis Shows Great Interocean Channel Will Lack Water to Handle Heavy Volume of Traffic

BY V. G. IDEN

THE United States has the Panama canal and all that it means. But just what does it mean? What price does the country pay for the canal? And what is its capacity to meet coming trade demands? The canal has cost the country more than $360,000,000, which makes possible the passage of, at a maximum, some 40 vessels a day between the Atlantic and Pacific, from one ocean to the other. It is a tremendous waterway, but will it be adequate to care for the heavy traffic of the future? The canal was opened to commercial shipping in the summer of August 1914. During 1915 a total of 4,894,134 tons traversed it. During 1920 a total of 11,236,119 tons of shipping was locked through. It is estimated by engineers that the canal can accommodate only 50,000,000 tons of shipping a year. If the traffic increases at this same rate, the country will find, within the next 20 years, that its much proclaimed waterway at the isthmus is inadequate to care for the demands of commerce.

It is for this the country has paid out more than $360,000,000 not counting the $25,000,000 sop to Colombia.

Source of Water Supply

From the Atlantic to Gatun, is a sea level approach, and from the Pacific to Miraflores is another sea level approach. At these two points, the drainage basins of the uplands have been empounded by dams and locks. The upper levels of the canal are supplied with empounded rain water. The important empound is Gatun lake, which covers 164 square miles, and which has a normal elevation of 85 feet above sea level. The watershed tributary to the lake is 1320 square miles. During the rainy season from April to the latter part of December, the surplus water is let off at the Gatun spillway.

Toward the end of the rainy season, the surface of the lake is raised to about 87 feet above sea level, in order to afford a surplus or reserve supply to keep the channel full to operating depth during the dry season. It is estimated that this reserve of water is sufficient to assure a surface elevation of 79 feet at the end of the dry season in spite of the consumption at the hydroelectric station, and allowing 41 passages of vessels through the locks each day with the use of the full length of the chambers, or 58 lockages a day when the shorter sections of the chamber are used and cross filling is employed, which would usually be the case.

The present canal was designed after careful study of the isthmian meteorology, but records then covered a period of but 15 years and mistakes have since been found. For instance it was reckoned that the minimum flow of water at Gatun based upon a record of 15 years was 1250 cubic feet per second during the three driest months of the year. In 1908 the flow was but 930 cubic feet. It was also reckoned that the total yearly flow could not be less than 5730 cubic feet per second. From May 1905 to April 1906, the average flow was 4526 cubic feet per second and in the same period 1911-1912 it was 4626, that is to say, much below the minimum admitted by the engineers to insure the feeding of the canal. It is an error to suppose that there exists a large margin of safety against an increased consumption of water and a decreased yield of the Chagres river and tributaries above Gatun.

As an illustration, a ruling by the canal administration instructs everyone in the zone to report leaky spigots. The water supply is too precious even during the wet season to permit a little thing like that to escape attention.

During 1920 the traffic through the canal was in excess of 11,000,000 tons. The expenditure of water was 1703 cubic feet per second for the hydroelectric plant and 770 cubic feet per second for the lockages. If the traffic had been 50,000,000 tons a year, the expenditure of water would have been greater than 1703 cubic feet per second for the hydroelectric plant, on account of the greater demand for the electric mules of the locks and the various lock operations. It would have been 3850 cubic feet per second for the lockages only. For both purposes, the expenditure would have been well over 5553 cubic feet per second. This amount of water is greater by about 1000 cubic feet per second than the yield of 1905-1906 and of 1911-1912.

In May 1920, there was a scarcity of rain never before seen. The Gatun watershed total yield was then only 28 per cent of the 10-year mean average. The flow was 1440 cubic feet per second against a 10-year mean of 5075 cubic feet per second. This indicates a prospective calamity which no imaginable storage can counterbalance.

But it must be remembered that the water for the plant and the locks is not the only water consumed. Certain losses can not be avoided, such as the losses in storage of the Gatun dam and the losses by evaporation. These two items in the report of the governor of the Panama canal for the fiscal year ended June 30, are shown to have been averaging 1100 cubic-feet-seconds during the year. Taking into account these losses, the traffic of 50,000,000 tons of ships would require more than 2000 feet above the yield of 1905-1906 or of 1911-1912.

Fixed Limit to Traffic

From the estimates already made, it would appear that the Panama canal is enclosed in a limited horizon of 30,000,000 tons of traffic per annum. On the other hand, there is every reason to expect a traffic of between 50,000,000 and 100,000,000 tons toward the middle of this century.

The only sensible means of meeting this prospect is to enlarge the canal. It has been suggested that another channel be dug to parallel the present canal. But that is impossible as the observations show that the present watershed will not yield an adequate supply of water. Then it would be necessary to cut through the isthmus at another point and tap a new watershed. That would be more expensive than the present canal.

Ex-Secretary of War Baker suggested that the country might turn to the Nicaragua project and build that canal, but engineers have ruled against the scheme owing to the volcanic nature of the land in that neighborhood. And should a second canal be built through Nicaragua what claims would Panama have against this country? The United States entered into a treaty with Panama to build the canal through her territory to connect the two oceans. That is an obligation which can not now be avoided. And if the Panama canal

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is not enlarged so that it may take care of all the traffic offering, the risk arises of having some other power step in and build a rival canal. That is not such a ridiculous proposition as it may sound at first blush.

Now consider the locks themselves. They are all 1000 feet long each and measure 110 feet broad. The new American cruisers are 105 feet broad. It will be extremely dangerous to send these new naval vessels through the canal when such a small leeway is offered them.

What is to be done?

Uniting the Two Oceans

When the international consulting board was assembled at Washington in 1905 three main schemes were submitted to its consideration:

1. The sea level canal, closed to the tides of the Pacific by a tidal lock, excavated exclusively in the dry, that is, by steam shovels and trains, having a bottom width of 150 feet in the earth sections and 200 in the rock sections.

2. A perpetual lock canal with a summit formed by a lake 85 feet above the dead level fed by the Chagres river.

3. A lock canal so constructed as to be gradually transformed without any interruption to traffic into a wide and deep waterway freely open to the Atlantic and to the Pacific, and the breadth of which would be such as to justify the name of "Straits of Panama." The width was to be 500 feet at the bottom and 600 feet at the water level, the depth was to be a minimum of 45 feet at the lowest stage of the tide all over the "Straits" and consequently 55 feet at high tide at Panama. After the construction of the lock canal, the whole enormous excavation was to be entirely executed on water by dredges and the spoils were to be transported into a lake created by a dam at Gamboa just above the point where the river enters the canal line. The estimate of the total excavation was 600,000,000 cubic yards.

The consulting board rejected this latter project because they did not know the progress made then in underwater rock excavation. Some expert engineers are now ready to reverse that decision, as they believe such excavation is entirely feasible. This third project can still be carried out and engineering reports to that end have recently been placed before President Harding. It will require four or five years for the preliminary work, and about ten years additional for the transformation proper. If completed within the next 15 years, the country may avoid entirely the criticism that would be lodged against it were the canal to prove inadequate for the commerce of the world.

The enlargement of the present canal would start with the dredging and the transportation by scows of the spoils in the lake created in the Chagres valley above Gamboa. The work would begin by enlarging enormously the bed of the canal, especially in that short section at the divide where the slides have taken place. These slides themselves will be of no account if the width of the canal is increased to 1000 or 2000 feet at the actual level of the Gatun lake. Much work could be carried out without interfering with the current operations of traffic through the waterway.

Some of the engineering reports now available give the lie to the supposed impossibility of reaching the proper level of 50 feet below sea level. The French company excavated in spite of the slides from an altitude of 300 feet to an altitude of 150 feet above sea level. Then the Americans took over the work and excavated from an altitude of 150 feet to 40 feet above sea level. Excavating another 90 feet will bring the bottom of the canal to 50 feet below sea level.

America's dependence upon the canal is becoming more and more evident as the nation grows. When the United States undertook the task, it never dreamed of the possibility of becoming involved in a worldwide war. Now national security demands a quick and efficient channel giving access to either the Atlantic or Pacific coast.

The Gatun dam is about a half mile wide at the base and 100 feet wide at the top, which is 103.5 feet above sea level. It contains a total of 22,958,069 cubic yards, which is more than one-sixth of the total excavated from Culebra cut to date. There is one of the most serious danger spots on the canal. A slight earthquake would open a fissure, in which case the canal would be destroyed the next day. A bomb dropped from the air might put the whole waterworks out of commission. An enemy might be successful in placing explosives upon a vessel passing through the waterway and sink her in or near one of the locks. A munitions ship was sunk in the Suez canal during the late war, and in order to move her out of the way of traffic the British blew her up. There was no damage done the Suez despite the intrigues of the enemy upon that occasion for the Suez is a sea level canal. An obstruction in the Panama canal could not be removed so easily. In these days of heavy taxation and tight money, any proposal to have the government spend more at Panama would undoubtedly meet with considerable opposition. But it is not understood that the improvements suggested would entail any great financial burden. Bonds for the new work could be issued on the basis of the net current earnings from the canal.

During the fiscal year ended with June, 1920, the canal revenues were in excess of current expenses of operation and maintenance by $2,387,594.14. The canal represents a capital expenditure of some $366,650,000. The interest on this sum of money at the rate the bonds were sold does not exceed 4 per cent and represents, therefore, a maximum of about $15,000,000. An increase of 13,000,000 tons of traffic will more than cover this interest.

How To Finance Work

It is entirely possible to order the transformation of the canal under a law which would specify that the expenses must be kept within the limits of the funds to be borrowed by an emission of bonds bearing an interest not greater than the last yearly surplus of the revenues of the canal above current expenses. In other words, if the interest on the new bonds was 5 per cent per annum the treasury could emit bonds for $40,000,000 basing the emission upon the earning of last year of more than $2,000,000, which would be the interest on the new issue. If during the next year, the surplus is greater than $6,000,000, the treasury could emit bonds for $80,000,000, and so on. Engineers estimate that the total cost of the transformation would not be in excess of $300,000,000.

The traffic through the canal in several recent months was at the rate of 10,000,000 registered tons a year. When the traffic reaches 20,000,000 registered tons, which would be equivalent to nearly 24,000,000 tons by Panama tolls measurement, the canal will produce earnings more than covering all expenditures of maintenance as well as of interest on the capital of construction. Probably within half the time necessary for the transformation into a sea level strait, the canal will have reached the financial equilibrium. Before the transformation is completed, the canal will earn also the surplus sum necessary to cover the interest on the transformation.

The Panama problem is a serious matter but it is not insurmountable. In time, we should have the straits of Panama.

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Practical U. S. Ship Problems—VI

Analysis of Present Day Shipping Board Situation from an Operator's Standpoint—Success Now More Difficult Than Failure

BY ROBERT EDWARDS ANNIN

WITH the advent of a new administration has come a crisis in the affairs of the United States shipping board. Since the situation, upon its accession to office was admittedly desperate, the incoming board was (not unnaturally) determined to have a "showdown"; that it might, at least, avoid responsibility for conditions clearly due to past policies and past blunders. Hence followed the announcement of Chairman Lasker regarding the enormous losses already incurred; the popular reaction to the disclosure; and the consequent revolt in congress against the continuance of the wasteful methods which have brought a four billion dollar experiment to the verge of collapse.

It is generally conceded that the extent of wartime losses will probably never be known. Apart from the difficulty of apportioning, between war and peace, overlapping and interlocking costs, expenses, revenues and claims, the board's accounts are reported to be in such a tangle as to render complete classification impossible. For instance, nobody seems able, or hopeful of ever being able, to tell what became of the enormous war revenues, produced by freights 10, 12 and even 20 times the rates now prevailing, and which are said to have been turned, from time to time, into the United States treasury. These should perhaps be credited to the board, and charged to war expense.

Why the Board Was Formed

What seems to have been almost completely overlooked in the discussion is this. While it is true that government construction, purchase, and utilization of tonnage proved an important, and possibly decisive, factor in American war operations, the shipping board scheme was originally adopted as a government enterprise in aid of commerce, and not at all as a war measure.

The United States shipping board was first proposed in the autumn of 1914 to "protect the American farmer from the greed of the foreign shipowners". It was emphatically demanded by President Wilson in his Indianapolis speech of Jan. 8, 1915, when our official policy was outspoken in favor of strict aloofness from the European war. It was passionately supported on these and other commercial grounds by the dominant party in the sixty-third congress; and opposed by the minority upon the plea that, if the bill passed, it would not only fail of its purpose but would probably embroil us with all the enemies of Germany and Austria. It was pointed out that no material amount of seagoing tonnage could be produced in less than 18 months, when the war would probably be over; that the purchase of tonnage already afloat would add nothing to the existing facilities; and that the only fruitful course proposed (the purchase of interned enemy ships) would drag us into war with those of whom we later became allies. The bill was killed in that congress by a filibuster; but finally passed the sixty-fourth congress in the heat of the 1916 campaign, which was debated largely on the peace issue.

Recognizing the indispensable service rendered by the fleet in war, and charging the largest possible measure of all losses to the war account, it is well to recognize that we are now face to face with results which afford an impressive test of this experiment in its purpose as originally avowed; —to restore our carrying trade, afford cheap transportation to our producers, and promote our foreign commerce.

But in the meantime, two elements have entered into the question which must, to an extent, modify the view of both parties to the original discussion. In 1915, and even 1916, the revolutionary effects of the war upon commerce, finance, and industry, had hardly begun to show. The extent of their influence on peacetime industry, and hence (probably) on international relations were undreamed of. But since the after effects of war have made themselves plain, it is obvious that possible and probable changes in the commercial position and policies of other nations, have altered our situation completely. For a brief illustration, it is clear that rivalry with a free trade England working on 10-shilling coal, may be an altogether different problem from competition with a protected British empire using 40-shilling coal and 90-shilling fuel oil. The second factor which has caused a change in sentiment is the demonstration of the necessity of a merchant marine for purposes of national defense. This was so clearly shown by the events of 1917 and 1918 as to need no further comment.

As a result of these elements, there has been a distinct modification in the attitude of that portion of public opinion which opposed the shipping board bill under the conditions, and for the avowed purposes of 1915 and 1916. Few are now found who are willing to assert that, amid the changed conditions of the present, we can safely neglect to supply ourselves—in some way—with a going merchant fleet.

Where to Start Criticism

In view of these facts, and in the present era of counsels darkened by words without wisdom, criticism, it would seem, should draw a sharp line between the operation of the fleet up to January 1919, and the policies and methods thereafter pursued. For surely in a crisis which by common consent required general government administration of all shipping, there can be no question that it was necessary for the growing fleet of the Emergency Fleet corporation to be run under government control.

Nor should the American people fail to accord full praise to the service rendered by this government agency during the war period. It was not that what was done was well done. As was remarked when the dog walked on his hind legs "It wasn't that it was well done." The wonder is that "it could be done at all". In view of this, criticism of war management is futile. Its mistakes,, blunders, cost and waste should be charged off on the books of the government, and in the minds of the American people. Insistence upon raking up wartime errors, in a partisan spirit, is worse than useless—for it tends to befog the urgent problems of the present and future, already obscure and puzzling enough.

Not so, however, with the policies and methods of the last 30 months. From January, 1919 on, the enterprise has progressively lost its war features and tended toward a test of the original proposition, the restoration of a merchant marine under government ownership. With an enormous war-

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time fleet on their hands and a period of declining freights and depreciating values clearly approaching, the taxpayers expected, and had a right to expect, that due consideration would be given to lightening the burdens of war taxation; that their property would be utilized and disposed of by methods promising such results as were then recognized as desirable, and at least potentially realizable.

The initial mistake is of course now generally admitted. The decision not to sell the surplus fleet while freights were high and buyers eager was a blunder of the first magnitude. But even worse was the decision to proceed with new construction, thus needlessly adding fresh tonnage to a fleet already too large. Warning voices were raised, but went practically unheeded. Experienced foreign owners were selling their tonnage while freights (rather unexpectedly) remained high. Hundreds of shipbuilders' contracts were cancelled while the cancelling was good; but the United States went serenely on with a building program obviously unnecessary, enormously expensive, and doomed to bring disaster upon the shipping trade of the whole world. Why? Because we must have a "well balanced fleet".

Coming down to the details of management, the personnel of the board was constantly changing, one man succeeding before his predecessor had fairly become warm in the saddle. The chairman had sometimes a full board; sometimes half a board; and for a long time (as in the case of Admiral Benson) no board at all. It resulted that this gentleman was obliged to struggle on alone under the crushing weight of labor and responsibility, as best he could.

Run Without a Policy

Similar changes in the departments were constantly occurring; consequently there was never a coherent policy in any direction. Different and conflicting policies were adopted as between ports, and even between operators. The rate making was quite unintelligible. An order from Washington was quite likely to be contradicted by a conflicting order from the local shipping board agency.

At one period the offering of the board ships was suspended with a view of stiffening rates, although the market rates afforded good profits. This policy simply held the umbrella over foreign tonnage at the taxpayer's expense. After the rates had dropped ten dollars per ton, the fleet was thrown on the market and rates promptly broke to below operating costs. Every operator was hampered and confused by receiving all the multiplex and complex orders and circulars issued to any operator; ranging from minute instructions as to matters on which the operator was the only competent judge (if he knew enough to be an operator), to the regulations regarding the purchase of fresh water at Banjee Wanjee, in which he was not interested at all, officially or otherwise.

Ships were allocated one day and recalled the next—sometimes in violation of charters already concluded and approved. Ships already under charter were diverted to other voyages, sometimes without notice to either operators or charterers. Such incidents steadily built up an ill-will from shippers which eventually became a distinct liability of the whole fleet.

Operators Crudely Chosen

As if to insure calamity, many ships were allocated to "operators" who were not only notoriously incompetent and inexperienced but often without even the recommendation of common honesty. Valuable ships were given over to the alleged "management" of firms headed by men of neither ability nor reputation. No one could ascertain the principles on which operators were selected, or why business was accepted or declined. Good business was "turned down" in favor of trades far less profitable. Old and experienced operators were passed by in favor of firms known to be of no competency or repute. Ships were allocated to unheard of companies, which when they had secured sufficient tonnage, promptly employed men influential in the allocating department at high salaries. (It has been said that circumstantial evidence is sometimes conclusive,-as when one finds a trout in the milk). Is it any wonder that the Emergency Fleet corporation in effect collapsed under such conditions, and the whole trade became demoralized?

The lamentable result has been the present condition of affairs in which universal obloquy is heaped on the shipping board and the whole mass of operators—just and unjust—alike. This is not fair, nor will it be useful. On the average, the employes of the board were at least as honest, as able, and as earnest, as the average man in any other occupation. Mentally they came from a distinctly higher class than the average men filling similar positions in private employ. The trouble was that many—even most of them—lacked the experience necessary to swing their work successfully under ordinary conditions and by established methods. Under the difficult conditions of the times, and by the cumbrous methods of government machinery the task imposed upon them of minute and meticulous direction and supervision of a heterogeneous mass of operators was impossible. They were called upon to decide off-hand all sorts of questions, small and large, for a complex business in which many of them were wholly untrained. No men could have made good under these conditions.

That there was some crookedness is more than probable, but nothing like the amount currently believed. Possibly some of them were tempted beyond their strength by unscrupulous greed. But the blame of this sort of thing usually is due chiefly to that curious mental strabismus which, with many citizens, seems to becloud the law of common honesty in dealings with government. This may be found in many who would scorn to be dishonorable in their private business affairs. Many of the socalled "operators" were adepts in tripping financial dances such as these young fellows never heard the tune of. And naturally they "put it over" on them.

Much of the iniquity of the "operators" has already been exposed and (very probably) the worst is yet to come. We have heard and are to hear much of unscrupulous dealings with the shipping board by men who never had the slightest claim to confidence, who never put, or intended to put a dollar of their own capital at risk, and who from the beginning intended to buy ships, charter ships, operate ships, and rob ships for their own profit only, leaving the people of the United States to "hold the bag".

Operators Who Made Good

There was, however, a class of honest operators who knew their business and whose personnel was fully trained for its difficult duties. Such firms accepted the board ships as a trust, and treated them as they would the tonnage entrusted to them by any owner, public or private, green or experienced. The writer is creditably informed of the record of two of such operating firms—new as to organization but of experienced personnel. One of these has turned in a total of over thirty million dollars of revenue, and the other of five and one half millions, both showing a large net surplus (even allowing for overhead) on the total of ships operated by them. And no suspicion of wrong doing has ever attached to either. These cases are merely typical. There were such operators on both coasts and on the gulf.

Again, as to criticism of contract

(*Continued on Page* 446)

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Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

T A. GRAHAM, assistant traffic manager of the Southern Pacific Co., has been named general manager of the Pacific Mail Steamship Co., succeeding John H. Rosseter, who resigned as vice president and general manager, Aug. 25, because of the "irreconcilable differences of opinion" with the other officers. CARY W. COOK, former general manager of the American-Hawaiian Steamship Co., was appointed assistant to Mr. Graham at the same time that the latter was made general manager. DAULTON MANN remains in his position as assistant general manager. While the exact differences of opinion between Mr. Rosseter and other officials of the Pacific Mail were not made known by George J. Baldwin, president of the company, when he announced the new appointments, they are said in Mr. Rosseter's letter of resignation to "concern questions of administration and operation, as well as the future of the company". Mr. Rosseter was director of operations of the shipping board during the war, and is one of the best known shipping men in the United States.

* * *

G. C. WILLIAMS has been appointed assistant superintendent of river steamers for the Southern Pacific Co. at San Francisco, succeeding F. A. Fish. For the last nine years, Mr. Williams has been agent for the Sacramento river steamers of the Southern Pacific company.

* * *

JOHN T. BLOOMER, formerly traffic manager for the Rolph Mail Steamship Co. and the Pacific Motorship Co., San Francisco, has been appointed traffic manager for the Latin-American line, according to announcement by R. S. Silva & Co., agents of the Latin-American for the Pacific coast.

* * *

F. V. ARCHER, formerly manager of Naumberg & Co., New York, has been elected vice president of the Thacher Propeller & Foundry Corp., Albany, N. Y., having charge of finance, costs, expenditures, etc.

* * *

J. W. MURPHY, for some time in charge of the India department of the Moore & McCormack Co., New York, has been made assistant traffic manager of the Commercial Steamship lines which are operated by the Moore & McCormack Co. This will relieve H. A. Pinder, traffic manager, who will devote much of his time to the United States lines, another Moore & McCormack subsidiary, organized to succeed the United States Mail Steamship Co. in operating shipping board vessels.

* * *

CAPT. HARRY R. CAGE present industrial manager of the Charlestown navy yard, Charlestown, Mass., has recently been assigned to the yard as captain. He will be succeeded as manager by Capt. William G. DuBose. Capt. D. E. Theleen, the present captain of the yard, has been placed on waiting orders.

* * *

H. S. EATON has been made acting assistant manager of the Admiral line's office at San Francisco, succeeding M. F. CROPLEY who has been transferred to Portland, Oreg., to take charge of the company's offices there.

* * *

S. NAKASE, sub-manager of the New York office of Nippon Yusen Kaisha, Tokyo, has been assigned to the head office of the company and is succeeded by KENKICHI SAWAI.

* * *

R. E. E. Hood, who has been identified with the oil trade for the past 16 years, has been appointed manager of oil sales of the United Marine & Fuel Corp., 113 Broad street, New York.

* * *

EDWARD W. VOORHEIS, Brooklyn, has been put in charge of the office of shipping commissioner of New York, succeeding PATRICK H. QUINN who resigned at the request of Secretary of Commerce HOOVER.

* * *

C. F. RUDOLPH, shipping commissioner of the port of Norfolk, has resigned at the request of HERBERT HOOVER, secretary of commerce.

* * *

H. F. ALEXANDER was re-elected president at a recent meeting of directors of the Pacific Steamship Co. Other officers were renamed for the ensuing year.

* * *

CLARENCE F. RAY, formerly Boston manager for Dickerson & Gaskell, and Fred P. Gaskell Co., and lately connected with the firm of W. N. Procter Co., Boston, will shortly join the staff of Capt. Samuel Pray, manager of the American-Hawaiian Steamship Co. and United American lines in Boston. Mr. Ray will take over the duties performed by the late Charles H. Langley.

* * *

FRANK A. FISH, assistant superintendent of river steamers for the Southern Pacific Co., at San Francisco, has retired after 45 years and 21 days continuous service with that company. He entered the service Aug. 10, 1876, as dock-receiving clerk for the Sacramento River-Vallejo steamers which docked at the foot of Market street. Thereafter he became purser on the Sacramento river steamer JULIA, where he remained 25 years, making 7488 trips from San Francisco to Sacramento.

* * *

A. F. MACK, president of the Cosmopolitan Shipping Co., has been appointed district manager of the shipping board with headquarters in New York. Mr. Mack will have under his control shipping board operations at New York, Boston and Philadelphia. He was born in Cleveland in 1863. For 18 years he was with the Baltimore & Ohio and Santa Fe railroads, and in 1898 he entered the employ of the American Steel & Wire Co., serving with that company as freight agent in charge of all their traffic operation in the Cleveland district. He later became assistant general freight agent and was assigned to New York where he had charge of domestic and export traffic, which under his direction assumed large proportion. Eventually this company affiliated with the United States Steel Corp., and as one of the guiding policies of the latter corporation was the consistent exploitation of foreign fields along definite lines, it organized the United States Steel Products. Mr. Mack was put in charge of the traffic and steamships departments of the company. In 1916, he accepted the presidency of the Federal Shipping Co., which was engaged in shipping operations with France. The Federal company was later renamed and is now known as the Cosmopolitan Shipping Co., which has operated as high as 28 ships and is now operating 20, and it is rated as one of the most profitable of the shipping board operators.

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Marine News in a Personal Way

Intimate Gossip About What Leaders in the Maritime World Are Doing

DAVID B. CARSON, the new commissioner of navigation in the department of commerce, has had his personal contact with the maritime industry through supervision of a line of river and transfer steamers on the Tennessee river for the Nashville, Chattanooga & St. Louis railroad. Mr. Carson, who succeeded E. T. CHAMBERLAIN on Aug. 27, is acting commissioner until his appointment is confirmed by the senate. Mr. Chamberlain, who was commissioner for 28 years, has been made assistant to the chief of the transportation division of the bureau of foreign and domestic commerce.

Mr. Carson is a native son of Kentucky. At the age of 12 he left school, but was persuaded to return and attended high school and a private college until he was 15. Having learned telegraphy, he went first with the Louisville & Nashville railroad, but soon went into the employ of the Nashville, Chattanooga & St. Louis to become a steamboat freight-check clerk. From this humble task, he climbed the ladder, serving apprenticeship in every department, to general manager. In his early railroading days Mr. Carson inaugurated the reweighing system long since adopted by all railroads.

Six years ago, when a new president assumed the direction of the Nashville, Chattanooga & St. Louis, Mr. Carson retired to his farm in Tennessee, but between times he acted as receiver for a small railroad in Georgia and engaged in the stock and bond business in Nashville. All through his career Mr. Carson has ridden his hobby of financing young men in various branches of trade and industry, and thus he has gained an insight into almost every business. Most of his life he has been a resident of Nashville, although for 15 years he lived in Atlanta. At one time Mr. Carson was mayor of McMinnville, Tenn.

* * *

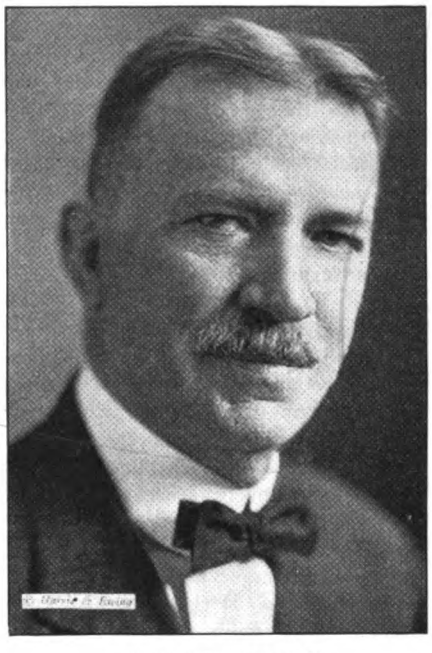
R. S. JAMES, a widely known operating steamship man, has been appointed manager for the Seattle district for the Luckenbach Steamship Co.

* * *

Capt. ALEXANDER E. S. HAMBLETON, recently of the ADRIATIC and formerly of the CELTIC and the BALTIC, has been given command of the White Star liner KOMINE, ex-COLUMBUS. He has been in the White Star line service for more then 30 years. He has been succeeded on the ADRIATIC by Capt. HUGH F. DAVID, another White Star veteran. Both captains at different times commanded the big transport JUSTICIA, ex-STATENDAM, in war services, and Captain David was in command the trip the submarines hit her after a 2-day attack.

* * *

EDWARD B. GERMAIN, general manager of the Harlan plant, Bethlehem Shipbuilding Corp., Wilmington, Del., has



DAVID B. CARSON

been appointed manager of sales of the above corporation, with offices at 111 Broadway, New York. Mr. Germain came to Wilmington in December, 1918, from Elizabeth, N. J., where he held the position of general manager of the Moore plant of the Bethlehem Shipbuilding Corp. He is succeeded by CECIL W. WEAVER, formerly general superintendent of the marine department.

* * *

F. A. LALLIER formerly vice president and general mnaager at Galveston, and J. D. LATTA formerly general agent at Dallas, for S. Sgitcovitch & Co., steamship agents, have formed the partnership of Lallier & Latta to engage in the steamship agency and ship brokerage business in the Cotton Exchange building, Galveston, Tex.

* * *

HENRY C. WILTBANK, formerly editor of the *Marine Journal* and shipping editor of the New York *Tribune*, on Sept. 1 began his duties as secretary of the National Merchant Marine association.

* * *

ALLAN MCLAIN has been named executive assistant to William J. Love, a vice president of the Emergency Fleet corporation. He has been with Furness, Withy & Co., for the past few years. He is a native of Baltimore.

* * *

CHARLES DONLEY has been appointed agent in western Pennsylvania, with headquarters in the Century building, Pittsburgh, for the Pacific Mail Steamship Co.

* * *

W. DAVIS CONRAD, New York admiralty counsel for the United States shipping board, has resigned, effective Sept. 1. He will represent private shipping interests.

* * *

MORRIS MALKIN, New York, secretary of the chartering committee for the shipping board during the war, has been appointed manager of the chartering department of the board, the successor of the bulk cargo conference.

* * *

RICHARD M. MERRILL, vice president of the Oriental Navigation Co., has been made assistant to Operating Vice President Frey of the shipping board, who has charge of physical properties.

* * *

CHARLES HARRINGTON, steamship agent at New Orleans formerly with the Kerr Steamship Lines has declined to accept the position tendered him by the Gulf operators of shipping board vessels to act as advisor for the newly created operating bureau of the board on matters affecting southern ports.

* * *

EDWARD C. TORGENSEN, formerly with the Old Globe line, E. H. Greene & Co., and the Royal Shipping Co., New York, has joined the staff of M. Patane Co., stevedores and contractors, 15 Moore street, New York.

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Electric Drive for Merchantmen

General Plan of Installation on S.S. Victorious and Sister Freighters—First Application to Large Carriers

ELECTRIC drive for merchant ship propulsion is rapidly coming out of the experimental stage and is being given serious consideration by many of the more advanced steamship owners and operators. Until after the war only sporadic attempts were made to equip merchant ships in the United States with electric drive. One unsuccessful attempt was made to equip a ship on the Great Lakes with a diesel-electric drive, but it was left to the American navy to demonstrate the value of electric drive for large vessels.

The first turbine-electric driven ship was put in service by Stockholm Rederiaktiebolag Svea of Sweden in 1914. Ships similarly equipped were put in service during 1919 and 1920 by this company and others, making a total of eight under the Swedish flag. There are today electric driven ships under the American, Norwegian, English, Japanese, French and Russian flags. The electric driven ships built or contracted for number about 50 with an aggregate of something short of 100,000 horsepower. The sizes range from 900 horsepower on small freighters to 6000 horsepower on the large passenger ships. Electric driven ships are now owned by some 13 different steamship companies.

During the past year the MARINE REVIEW has described the equipment on the freighter FORDONIAN and the passenger ship CUBA. The most noted advancement of the electric drive, however, has been made possible through the contract made with the General Electric Co. by the shipping board to so equip 12 of its freight vessels. The installations have been made on the ECLIPSE, INVINCIBLE, INDEPENDENCE, ARCHER and the VICTORIOUS. Electric drive will be installed on the DEFIANCE, TRIUMPH, COURAGEOUS and other freighters of the shipping board. These vessels all measure around 11,000 deadweight tons each.

Typical Electric Installation

The VICTORIOUS is a good example of the electric drive equipment placed aboard these vessels. This ship was built by the Bethlehem Shipbuilding Corp. at its yard at Alameda, Cal., in 1918. She has a length of 440 feet, a beam of 56 feet, and a mean draft loaded of 28 feet 7½ inches. Her displacement light is 4078 and loaded 15,946 tons. Her carrying capacity is 11,868 tons, with a registered tonnage of 7898 gross and 4983 net. The vessel was formerly equipped with marine geared turbines of the war emergency type.

The conversion of the VICTORIOUS and the other freighters to electric drive was brought about largely through the co-operation of Commander V. V. Woodward, ex-manager of the repair department of the Emergency Fleet corporation and H. B. Taylor, the chief turbine engineer. The decision to adopt the electric drive was reached because it was felt the ship could be more easily maneuvered; there would be more reliability in the engines and the cost of repairs would be reduced to a minimum. One important thing, they considered, about the electric drive equipment is that there is little to get out of order and, therefore, no need to send the ship to the repair yard after she has been in service for a moderate length of time.

In making the conversion on the VICTORIOUS it was necessary to install some new equipment. This new equipment consisted of three Scotch boilers, Diamond type soot blowers, and superheaters furnished by the Power Specialty Co. The General Electric Co. supplied a generator, an induction motor, a control equipment and two exciters. Specifically the electric drive equipment consists of one General Electric, 8 stage, 3160 horsepower, 3000 revolutions per minute, Curtis turbine connected to 1 3380 kilovolt ampere, 2400 volt, 50 cycle, alternating current generator; one 3000 horsepower, 100 revolutions per minute, induction motor; complete control equipment, and two 35 kilowatt, 125 volt, direct current engine driven exciters.

The ECLIPSE was the first of the freighters equipped with turbine-electric drive for the shipping board, and on her first trip it has been claimed she did not give a good performance. But on this vessel no provision was made to utilize the superheat and the old auxiliaries were retained. That permitted approximately 6000 pounds of steam to go to waste, whereas this surplus steam from the turbines could be utilized to run the auxiliaries. In addition, the circulating pump on the ECLIPSE was said to be too small. These defects were remedied later and the savings in steam were perfected on the VICTORIOUS and other freighters equipped with the electric drive. In the case of these improved installations, it has been found that there is a saving of from 10 to 12 per cent in the consumption of fuel.

The turbine-electric drive equipment makes it possible to utilize the superheat to an extent that is possible on no other type of ship. The VICTORIOUS is equipped with three Foster flue type superheaters similar to the 31 other American ships fitted with Foster flue type superheaters with the exception that these superheaters are designed for a higher superheat, namely 225 degrees, at the boiler outlet, and not less than 200 degrees at the turbine inlet. The superheat arrangement is designed to give a minimum interference with draft both in the boiler tubes and in the connections between main superheater heads and tube sections. This type of superheater has rolled joints similar to the boiler tubes, which permits prompt and ready repair by the crew or any repair yard if necessary.

Operators Are Making Tests

Superheaters of this general design, with the addition of a Foster waste heat type element for a moderate amount of superheat to be used by the auxiliaries, have been installed in a number of British ships for superheat very much higher than this installation. It is possible to obtain superheats of 300 degrees or over by using combination double stage superheaters including the waste heat flue types when desired.

Experimentation with this particular form of drive has progressed to such a point that its success is now assured. Recently the Western-Union advertised for bids on a new cable ship which it proposed shall be equipped with electric drive. Furthermore, it is understood, a number of private steamship owners and operators are interesting themselves in the electric drive and intend to have their naval architects give the matter consideration. One of the good features of the installations made by the shipping board grows out of the fact that the government vessels have been allocated to various private lines for operation where prospective owners can study the practical merits of the electric drive. The ECLIPSE has been operated by the United-American Lines. The INVINCIBLE has been operated by the Cosmopolitan Shipping Co. The TRIUMPH has been operated by the Strachan Shipping Co. and the COURAGEOUS has been under the management of the General Navigation Co. The INDEPENDENCE, ARCHER, VIC-

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TORIOUS and DEFIANCE have been withdrawn from operation while the new installations were being made.

That the electric drive is admirably adaptable for the largest ships has been demonstrated clearly by the results obtained on naval vessels. The NEW MEXICO is of a tonnage comparable to the largest of the transatlantic liners. This naval vessel has been in service over two years. The NEW MEXICO uses one generator for speeds up to 17 knots and two generators for speeds from 17 knots to full speed, which is between 21 and 22 knots. For speeds up to 15 knots the motors are run on the 36-pole connection, so that at 15 knots the turbine is running at its designed full speed; from 15 knots to full speed the motors are run on the 24-pole connection. This arrangement gives good economy at all speeds. At a speed of 10 knots, the NEW MEXICO uses about 16.7 per cent less oil than her sister ships, which are fitted with direct-connected turbines and have geared cruising turbines. Or, in other words, her sister ships, the IDAHO and MISSISSIPPI, use about 20 per cent more oil than the NEW MEXICO. At 13 knots the corresponding figures are 29.9 per cent or 42.7 per cent; at 16 knots the figures are 32.3 per cent or 47.8 per cent; at 19 knots the figures are 28.6 per cent or 40.1 per cent; at full power the figures are 24.4 per cent or 32.2 per cent. At 19 knots and also at full power the NEW MEXICO uses about 0.975 pounds of oil per shaft horsepower, and at 15 knots she only uses 1.1 pounds of oil per shaft horsepower.

Easy to Maneuver

Aside from the question of economy, electric drive gives the navigator a better control over his ship. On the VICTORIOUS it was found possible to reverse from full speed ahead to full speed astern or *vice versa* in four seconds. In the case of the NEW MEXICO it has been found that more satisfactory operation is obtained when using one generator than when using two, and it is customary, when in dangerous waters where it is desired to take all possible precautions, to use one generator for driving the ship and to keep the other turning over idle. If the ship is getting under way from an anchorage and has to turn as soon as the anchor is away, the signal is given for standard speed ahead on one side and the same speed astern on the other. With this arrangement the ship will turn absolutely on her heel without gaining ground either ahead or astern. With other engines, where it is not possible to regulate the speed so quickly and accurately, the possibility of getting speed on the ship in one direction or in the other is much greater.

"In the case of merchant ships certain conditions are absent which add to the advantage of the electric drive on war vessels," says W. L. R. Emmet of the General Electric Co. "Economy at widely varying speeds is not equally valuable and certain matters of location of parts and interchangeability of units in use are less important. In such vessels the reasons for using electrical apparatus instead of mechanical gearing as a speed reducing bond between turbines and propellers is less obvious and should be definitely considered on its merits.

"While the diesel engine for ship work has had a large and very interesting development, it is obvious that in the existing state of our knowledge the use of steam must be considered for large vessels, and it is also obvious that the high-speed steam turbine has advantages over the engine or the low-speed turbine which must cause the replacement of the latter types if reliable means for the use of high-speed turbines are available.

"Our company has carried on extensive experimentation with turbines, gears, and electrical apparatus for ships. These studies have clearly shown that if the conditions of reversing and turbine application are correctly allowed for, the electric drive gives a transmission efficiency practically equal to that of gears in the best condition; that it affords simple rotation and freedom from mechanical hazards; that it greatly simplifies the turbine and avoids in it dangerous temperature effects; that it affords space saving in most ships and in many cases eliminates long lines of shafting and shaft alleys; and that it is easily repaired without the use of machine shops and affords the most dependable kind of machinery which has ever been used to drive vessels."

The ECLIPSE, and other shipping board vessels, is furnished with one turbine alternator wound 3-phase, having two poles, and normally rated to generate 2300 volts, 3380 kilovolt-amperes at 70 per cent power factor and running at 3000 revolutions per minute. As the power-factor indicates, this boat is driven by an induction motor. At present, the 3000-ton coast steamship CUBA is the only ship yet in service driven by a synchronous motor. In this boat, one 2-pole alternator having a normal rating of 1150 volts, 2350 kilowatts at 100 per cent power factor and running at 3000 revolutions per minute supplies the power.

Since the synchronous motor must operate first as an induction motor during the operation of starting and coming up to speed, and then as a synchronous motor after the application of excitation to the field, the design must be a combination of the two types. Some of the factors involved in the design are such as to be advantageous to one type but disadvantageous to the other. For example, a small air gap is desirable in an induction motor, but results in low breakout capacity in a synchronous machine; deep pole tips are required to give space for a heavy amortisseur winding, but this arrangement if carried to extremes causes high field leakage and an increase in excitation as a synchronous machine.

Changes in the Engine Room

The installations on the shipping board vessels were determined upon after the ships were constructed and once equipped with steam drive. Therefore, it was necessary to adapt the new equipment to the old engine-room lay-out. The overall efficiency and life of the main propulsion equipment is largely affected by the layout of the engine room, the construction of suitable foundations, and the proper installation of auxiliaries, piping, cable, and control.

In arranging machinery in the engine room, several fixed conditions have to be met. As in the case of single-screw ships, the motor or the turbine-gear unit has to be placed on the center line of the ship and at an elevation to suit the propeller shaft. However, a number of auxiliaries while they are independent of the main unit, require considerable thought in connection with the service to which they are to be applied, their location, accessibility, and proper installation.

The system of turbine-electric drive, it is claimed, has more flexibility in the placement of machinery than any other type, as the turbine generator can be placed amidship with the boilers while the motor can be placed aft. The turbine generator can be placed at the side of the center line of the ship, or can be placed over the condenser; either arrangment has arguments in favor of it, depending on the design and class of the boat. In cargo boats with full lines, an economical arrangement is to have the turbine generator amidships with the boiler room and motor aft, thereby saving considerable engine-room space, shaft, and shaft-alley, and eliminating the obstruction of the shaft-alley in the cargo space.

Sale of the FRANCIS WIDLAR, which went on the rocks of Pancake shoal last November when downbound with a cargo of ore, again has been made. W. D. Decker, who recently purchased the damaged freighter, has sold her to Canadian interests. After being released from the shoal, the FRANCIS WILDAR was taken to Batchawanna Bay.

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FLEET OF 28 WOODEN HULLS IDLE IN OAKLAND CREEK, SAN FRANCISCO BAY. THE BETHLEHEM

Bethlehem to Build Diesel Engines

THE Alameda, Cal., and the Potrero (San Francisco) yards of the Bethlehem Shipbuilding Corp. will not be closed, but, on the contrary, both are to be operated for constructing a new and improved type of diesel engine, and for building large motorships in which these engines are to be installed, according to J. J. Tynan, vice president of the Bethlehem corporation, and manager of the plants on the Pacific coast. Mr. Tynan recently completed a survey of shipbuilding conditions on both the Atlantic and Pacific coasts, and, after conferences with Charles M. Schwab, president, and other officials of the Bethlehem corporation, issued a statement, in which he said:

"I am satisfied that we have reached the bottom. Bad as things seem, they are infinitely better than they were in 1908. And they are going to improve from now on. Speaking for the Bethlehem interests, I can say very emphatically that we are not downhearted. The report that we are planning to shut down our Alameda yard is without warrant. We have no intention of closing the Alameda or the Potrero works. If we cannot get ships to build, we will build something else. We are going to operate both works; we are on the eve of a great industrial revival, the greatest, I believe, that the world has ever seen. And the Bethlehem organization is going to be on its feet and moving when the new day dawns.

"The Bethlehem interests have obtained the rights to build a good diesel engine. We are not only going to build the engines here on the Pacific coast, but we are going to build everything that goes with them—ships, auxiliary machinery and everything. Our experts will be back shortly from Europe, where they have been making an intensive study of the new engine and of every detail of its production."

Long strings of hulls built for the shipping board during the war, line the bank of the Oakland creek, in front of the Alameda plant of the Bethlehem corporation, and it is reliably reported that these hulls will be converted into motorships as the first work to be done after the revival of operations in the Alameda and Potrero plants. Few power plants had been installed in these hulls when the shutdown came, and, consequently, they can be adapted for the new type oil engines with considerably less work and at much less expense than if they were equipped with steam boilers and engines.

Mr. Tynan, it is understood, will not issue further statements regarding the operation of the plants until after the visit of Charles M. Schwab, president of the Bethlehem corporation, to San Francisco, when details of the reopening of the yards will be decided and made public. About 15,000 men were employed by the Bethlehem yards in the war rush, but it is hardly to be expected that so many will be given employment in the construction of oil engines and the rehabilitation of the steam hulls for the use of these diesel plants.

Demand for Motorships Increases

A slow but steady increase in the demand for motorships is being felt all along the Pacific coast according to reliable reports reaching San Francisco. Greater cheapness of operation, and smaller number of men required in the crews are the reasons given. The reduction in the size of crews was of special importance during the ill-advised seamen's strike, but since the marine workers have accepted the 15 per cent wage cut, and the American plan of employment and have gone back to work, this is not such a factor, since San Francisco alone has about 6000 more marine workers than have jobs, due to the return to work of the union men after the majority of the jobs had been filled by nonunion men.

Readjustment of the affairs of the Pacific Motorship Co. is announced by W. L. Comyn & Co., by means of the organization of the Ocean Motorship Co. to take over the contracts with the Australian government for the sale of seven motorships. The new company will handle the debts of the Pacific Motorship Co. and operate the fleet on the Pacific coast. Five of the motorships of the company had been tied up at Sausalito, Cal., for some weeks, but are now out, with the other two, on trade routes. The receivership for the Pacific Motorship Co. and the Pacific Freighters Co. has been removed by an agreement between the parties to the suit and in the United States district court. The original contract with the Australian government called for the purchase of the vessels under a bond issue of $1,250,000.

Beginning a new direct passenger and freight service between the Pacific coast and Europe, the British motorship SOMERSETSHIRE, first of the Royal Mail Steam Packet Co.'s vessels to appear on the west coast, came into and cleared from San Francisco, with a full cargo, in August. The SOMERSETSHIRE, 15,000 deadweight tons, is one of the largest vessels of her type afloat. She is built as a combination freight and passenger carrier and is equipped to carry everything from diamonds to crude oil.

Practical Ship Problems

(*Continued from Page* 441)

terms, most operators had nothing to say about the terms of operation. They were told to sign on the dotted line and did it. All operators had to work amid the discouragements of war conditions, and postwar disorganization here and abroad; shackled by the provisions of American laws, hampered by official interference with their efforts, which, however well or ill meant, was absolutely fatal to real efficiency. There were bad operators and good operators. In justice to the many who went quietly ahead and did their best under all discouragements, the public should make some discrimination between the two.

All discussion of the past is fruitless under present conditions except as it may throw light on our future course. A new administration has in-

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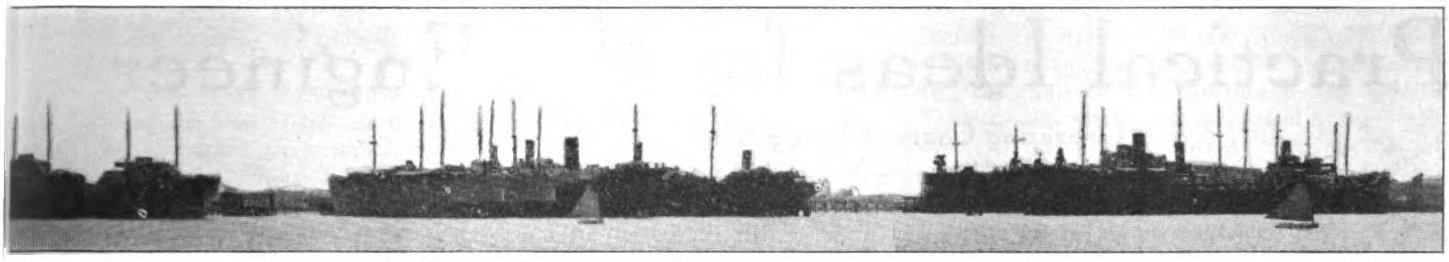

SHIPBUILDING CORP., ACCORDING TO REPORT, WILL CONVERT THESE TO MOTORSHIPS

herited what Mr. Lasker has described as "the greatest commercial wreck in history". The disclosures already made have shocked the country and congress; and the reaction is so strong that it is a grave question whether a flat abandonment of the experiment will not result.

How then, if at all, can a course be found which will give some promise of even partial success in maintaining an American commercial fleet? The shipping board can not shut its doors tomorrow and go out of business. It has millions of tonnage which for the moment can be neither sold, chartered, nor operated except at a loss.

If laid up, the bad ships will get no better, and the good ships will deteriorate. If sold without restrictions as to flag, the experiment will cease *ipse facto*—for economy of operation will drive them to foreign registers. If sold with restriction to the American flag, some may be operated for a while, but the vast majority must be laid up pending a decided revival of commerce. Meantime, hundreds of surplus ships hang over the market as a menace, and their mere existence, though idle, acts so as to delay or prevent any material improvement in rates. Every private owner, the world over, is watching for the new board's policy with an interest as intense as that of the American taxpayer. This is not a situation that can be relieved in a month, nor in many months. Nor can such a problem be solved out of hand.

Popular impatience demands an immediate solution. No such result is possible. The chairman has a reputation as an organizer, and his selection of aides should give great encouragement to those who hope for the eventual establishment of a merchant marine. Shipping opinion is unanimous that the first step should be the excision of inoperable ships and incompetent operators. And past experience proves that the only way to run the ships is through the agency of experienced operators, who shall have powers commensurate with their responsibilities. For the present, and for some years to come, the government must aid the ships unless the project is to be abandoned altogether.

The present incumbents are no more accountable for present conditions than for Adam's fall. "Hammering" the new board before it had even had time to ascertain conditions will not help, but may hurt very much. It will take a long time and much work to bring the enterprise to even the moderate degree of success which is possible in view of past errors and present conditions, but it would not take much of either now to insure its failure.

"Rome wasn't built in a day"—but it was burnt in a night. Those who maliciously or thoughtlessly make the board's task harder, are reducing the chance of ultimate success, and improving the chance of immediate and disastrous failure.

(*To be concluded*)

Ship Board Allocations

DOCHET, 7814 tons, assigned Export Steamship Corp. managing agent. Withdraw managing agency Oriental Navigation Co.

CITY OF ALTON, 7840 tons, assigned Lykes Bros. managing agent. Withdraw managing agency Northern Steamship Co.

WOODMANSIE, 5253 tons, assigned Harriss, Magill & Co. managing agent. Withdraw division of operations managing caretaker.

COULEE, 4125 tons, time chartered to J. S. Otis Mahogany Co. for one round voyage to Central America. Assigned Lykes Bros. management form M-2. Withdraw managing agency Lykes Bros.

LAS VEGAS, 8366 tons, assigned Columbia Pacific Shipping Co. managing agent. Withdraw managing agency Central Steamship Corp.

WEST JESSUP, 8769 tons, assigned Frank Waterhouse & Co. managing agent. Withdraw division of operations managing caretaker.

COMMACK, 7825 tons, assigned International Freighting Corp. managing agent. Withdraw managing agency Mississippi Shipping Co. managing agent.

TERRE HAUTE, 8757 tons, assigned Mississippi Shipping Co. managing agent. Withdraw managing agency International Freighting Co. Delivery to be affected at Buenos Aires.

LEHIGH, 7825 tons, assigned North Atlantic & Western Steamship Co. managing agent. Withdraw division of operations managing caretaker.

WESTWARD HO, 8700 tons, assigned Thorndyke & Trenholme, Inc., managing agent. Withdraw division of operations managing caretaker.

HAWARDEN, 9488 tons, assigned Struthers & Dixon, managing agent. Withdraw division of operations managing caretaker.

NEWBURGH, 8822 tons, assigned Munson Steamship line managing agent. Withdraw division of operations managing caretaker.

LAKE FILIMORE, 4095 tons, assigned Mallory Steamship Co. managing agent. Withdraw division of operations managing caretaker.

VINTON COUNTY, 4050 tons, assigned Clyde Steamship Co. managing agent. Withdraw division of operations managing caretaker.

ALCONO, 5070 tons, assigned Trosdal, Plant & LaFonta managing agent. Withdraw division of operations managing caretaker.

BARTHOLOMEW, 4155 tons, assigned New York & Cuba Mail Steamship Co. managing agent. Withdraw division of Operations managing caretaker.

LUXPALILE, 7825 tons, assignment division of operations managing caretaker cancelled. Assigned A. H. Bull & Co. managing agent. Withdraw managing agency Roosevelt Steamship Co.

NACATA, 8727 tons, assigned Mississippi Shipping Co. managing agent. Withdraw division of operations managing caretaker.

SALAAM, 8727 tons, assignment division of operations managing caretaker cancelled. Assigned Mississippi Shipping Co. managing agent. Withdraw managing agency Sigsbee, Humphrey & Co.

WILDWOOD, 7840 tons, assignment division of operations managing caretaker cancelled. Assigned Waterman Steamship Co. managing agent. Withdraw managing agency Callaghan, Atkinson & Co.

SAUGUS, 7825 tons, assignment division of operations managing caretaker cancelled. Assigned A. H. Bull & Co. managing agents. Withdraw Moore & McCormack, managing agents.

APUS, 9605 tons, assigned Struthers & Dixon managing agent. Withdraw managing agency E. C. Evans & Son.

EASTERN GLEN, 8520 tons, assigned North Atlantic & Western Steamship Co. managing agent. One voyage only. Withdraw division of operations managing caretaker.

LIBERTY GLO, 7825 tons, assigned International Freighting Corp. managing agen. Withdraw division of operations managing caretaker.

JALAPA, 9417 tons, assignment division of operations managing caretaker cancelled. Assigned Thorndyke & Trenholme, Inc., managing agent. Withdraw managing agency Frank Waterhouse & Co.

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Practical Ideas for the Engineer

Operating Costs of Large American Motorship—Shaft Repairing—New Tipple—Polyphase Fuse

ON HER maiden voyage from Puget sound to Atlantic ports and return, the 6000-ton motorship KENNECOTT has established a record of which both builders and owners are extremely proud. The KENNECOTT promptly loaded for a second voyage to Atlantic ports. She has upheld every expectation of her builder, the Todd Shipbuilding & Drydock Corp. and of McIntosh & Seymour, who constructed the twin 1200 horsepower engines.

The vessel was completed at the Todd yards, Tacoma, Wash., on March 17 last and made her maiden run to New York with 3,500,000 feet of lumber. Figures reported of this voyage as to fuel consumption are surprising. They show that the saving in oil, figured at $1.70 per barrel, over a steamer of similar size, 8000 measurement tons, for the entire voyage is $10,354. Some of this saving is offset by the greater consumption of lubricating oil by a diesel engine than by a steam engine. This difference is figured at $2500 so that the total saving is still large.

In addition to the saving in fuel oil, the KENNECOTT registered economy in the matter of labor and auxiliaries. Not once during the voyage did either engine of the motorship have to be shut down for any cause. The machinery worked perfectly and there was no cost for repairs off ship. Everything necessary was done in the ship's machine shop aboard. On her run between Aberdeen, Wash., and the Panama canal, 3880 miles, she made the distance in 15 days averaging 10.7 knots. From Cristobal to New York she averaged 10.1 knots, making the 1974 miles in eight days. On the return she made the 1903 miles between Baltimore and Cristobal in 7½ days averaging 10 6 knots. Between Balboa and San Pedro, Cal., she did the 2919 miles in 10 days 20 hours, averaging 11.2 knots. Against a strong head wind between San Pedro and San Francisco she averaged 10.7 knots making the distance in 34½ hours.

According to statistics of the voyage, the actual saving in fuel consumption over a steamer was approximately 120 barrels per day. In the 43 days steaming, this saving at $1.70 per barrel totaled $8772. The saving in fuel consumption for loading, discharging and auxiliaries as compared with steam consumption of 40 barrels per day was no less than $1582 for this item alone in 14 full days work. Altogether the builder and owner, the Alaska Steamship Co., are greatly delighted with the KENNECOTT's performance. She is under charter to the Williams Steamship Co. for service in the intercoastal route.

Difficult Shaft Repair

A difficult repair and welding problem recently was performed by the Welded Products Co., Birmingham, Ala. Four bronze sleeves were shrunk on a heavy propeller shaft. It was intended to have the sleeves close enough in series to admit of caulking the joints. On cooling, however, it was found that the sleeves lacked approximately half an inch of butting—a distance too great for effective caulking. The sleeves at either end of the series were of slightly greater diameter than the two intermediate sleeves, the former being designed to turn in bearings and the latter to serve merely as a protection for the steel shaft where it would otherwise be exposed directly to the corroding influence of salt water in the section between the two bearings.

To have brought the sleeves together by removing and reshrinking them, even if it could have been succesfully accomplished, would have involved considerable difficulty and expense; and it seemed more than probable that such an attempt would have resulted in a repetition of the initial failure. For this reason it was decided to experiment with welding. It was not, however, deemed advisable to fill in the spaces by adding metal fused with the blowpipe while the sleeves were frozen to the shaft, as it seemed likely that the weld would pull apart on cooling. The problem, then became one of applying preheat in a manner that would not result in disalignment of the shaft.

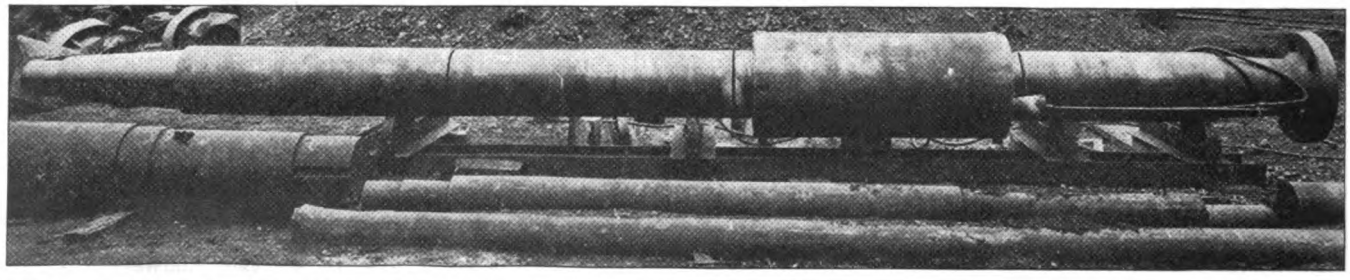
First a special preheating hood was prepared to admit of uniformly heating a single one of the four sleeves. Then one of the sleeves was expanded by preheating the area enclosed in the hood, when the preheated section was welded to the cold sleeve next in series. This process was then applied to the succeeding sections serially, in each instance heating a single sleeve and welding it to the cold sleeve adjoining.

Open Public-Owned Coal Tipple at New Orleans

With appropriate public ceremonies, the new coal tipple constructed by the New Orleans dock board close to the public cotton warehouse and public grain elevator was dedicated in August. This adjoins the wharves assigned to the big transatlantic lines and Central American steamers.

It is equipped to handle run-of-the mine coal with a loading capacity of 800 to 1000 tons per hour maximum. Although provided with a storage capacity of 25,000 tons, the primary purpose of the plant is to move coal as fast as it can be handled.

Beside the hopper house, the plant includes three loading towers and one unloading tower. Two of the three loading towers travel along a track to give direct discharge into the hatches. The loading tower is a steam operated, traveling, hoisting tower with a projecting



PROPELLER SHAFT ON WHICH BRONZE BEARING AND PROTECTING SLEEVES WERE SHRUNK. COOLING LEFT AN OPENING APPROXIMATELY ½-INCH BETWEEN SECTIONS

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boom carrying a trolley and a grab bucket.

Chutes have been provided at points along the storage pile so that coal may be discharged from wing conveyors directly into railway cars. Coal received in gondola cars will be unloaded by means of a grab bucket operated from overhead traveling crane and discharged into track hoppers.

The plant is so equipped as to permit the loading of coal into vessels from any of three sources, namely, barges, storage piles or railway cars, or from any two of these three sources at the same time.

Develops Polyphase Fuse for Motor Circuits

Since polyphase motors frequently run single phase and sometimes with disastrous results when the fuse of one phase burns out and fails to release the circuit breaker, a Chicago company has devised a low voltage auxiliary release coil which is embodied in the renewable cartridge of one of the standard type fuses. It is said that more multiphase motors burn out from single phase operation than from any other cause. Relay systems cannot be developed for when one fuse blows, the voltage across the lines drops to such an extent that the coils are not

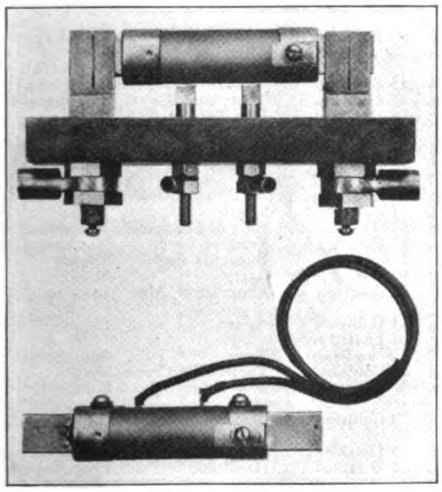

FIG. 1—(ABOVE) MULTIPHASE FUSE WITH BACK CONNECTION. (BELOW) SAME WITH FRONT CONNECTION

energized. With the new type of fuses, the blowing of one fuse causes one of the others to blow also, thereby preventing the motor from operating single phase.

Fig. 1 shows two of these fuses, the one above arranged for back connection and the one below for front connection. Leads are brought out from the low voltage coil in each cartridge and are used to form the interphase circuit, either star or delta connection being used. Fig. 2 shows the diagram for the auxiliary wiring of the fuses using the front connection. As the cartridge can go into the case in but one position, it makes the auxiliary connection with the case itself. The fuse is powder packed and designed upon the time limit principle. In blowing, each fuse acts as a circuit breaker. The failure of one fuse equipped with a low voltage coil promptly causes the blowing of one of the other fuses. The new multiphase fuse is a development of the Federal Electric Co., Chicago.

Two Pontoon Docks Serve Sparrows Point Yard

The new dry dock of the Bethlehem Shipbuilding Corp., Ltd., at its Sparrows Point plant, is the second of that company in the Baltimore district and completes the original project for the operation of two docks at that point. The first floating dock at Sparrows Point was put in operation in March, 1919, and has a lifting capacity of 20,000 tons. The new dock has a capacity of 6000 tons, is 418 feet in length, 100 feet in width and is suitable for taking a vessel of 20-foot draft. It is located alongside of the 20,000-ton dock, making use of the pier and bulkhead planned and constructed for this purpose when the concrete work for the larger dock was put in. The piers at either side of the two docks have pile foundations and extend out into the bay a distance of 1260 feet. Material in the new dock is handled by means of a locomotive crane.

In construction the new dock is similar to the 20,000-ton dock, being of the pontoon type, with individual wooden pontoons and continuous side wings of steel. There are 11 pontoons, which are attached to the side wings in such a manner that the wings act as continuous girders extending the full length of the dock. Each pontoon is divided into two compartments by a watertight bulkhead passing through its center, lengthwise of the dock, and has a centrifugal pump located in each compartment for use in emptying the pontoons and raising the dock. The pumps are electrically driven, being direct-connected to motors vertically mounted in watertight casings on the decks of the side wings.

A double control house on shore, from which the motors are controlled, houses the electrical switching apparatus for both the 20,000-ton dock and the 6000-ton dock. Electrical connections are such that by means of individual switches the pumps of any pontoon can be operated independently of those of the others, or by means of a master switch the pumps of all pontoons can be operated simultaneously. This feature provides means whereby the stresses in the vessel being docked may be equalized by utilizing the individual control and bringing a decreased or increased upward pressure to bear on certain pontoons, as required.

A gate valve is located in each end of each pontoon so arranged that the water is allowed to enter through the pump ports but is by-passed into the

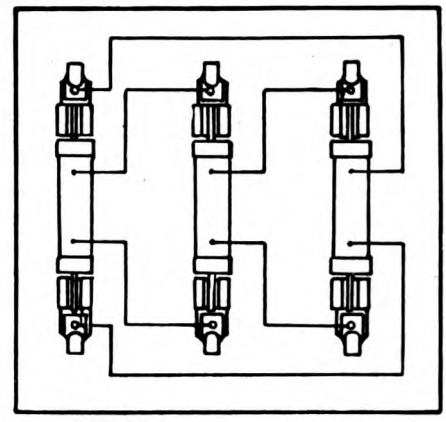

FIG. 2—DIAGRAM OF INTERPHASE WIRING FOR MULTIPHASE FUSES

dock to avoid passing through the pumps. Operation of the gate valves is by hand-wheels located on the decks of the wings. The wings are 30 feet high and 12 feet wide at the base. They are of watertight construction and communicate at the base with the compartments of the pontoons.

William T. Donnelly, New York, consulting engineer, prepared the plans for the dock and the construction work was done by the Sparrows Point plant.

Barge Canal Boats of New Type

The General Electric Co., Schenectady, N. Y., recently contracted to supply electric auxiliary equipment for five diesel engine barges constructed by the McDougall Duluth Shipbuilding Co., Duluth, for the Erie Canal Transportation Co., New York.

The barges are 250 feet long, 36-foot beam and 10 feet draft, each being equipped with a 140 brake horsepower direct reversible diesel engine. The displacement of these barges is 2150 tons.

The electric equipment consists of three 10-kilowatt, 400-revolutions-per-minute generators, each driven by a 15-horsepower diesel engine for auxiliary power and lighting on each barge. There are also seven electric motors ranging from 10 to 1 horsepower, used on pumps, steering gear, etc.

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name of Vessel	Date	Nature	Place	Damage Resulting
Alaska	Aug.	6 Sank	Eureka	Total loss
Adda	July	16 Collision	At sea	Bow damaged
Athlon	Aug.	1 Grounded	Port Ludlow	May be total loss
Adriatico	Aug.	10 Fire	At sea	Slight
Andrew Jackson	Aug.	8 Disabled	Ponta Delgada	Prop. blade missing
Ario	Aug.	19 Collision	Tompkinsville	Undamaged
Arzila	July	29 Ashore	Detlif Point	Not stated
Aldgate	Aug.	20 Disabled	Gibraltar	Boil. leaking
Alvarado	Aug.	2 Grounded	London	Not stated
Alexanderpolder	Aug.	11 Collision	At sea	Slight
Africanic	Aug.	24 Heavy weather	At sea	Rivets gave way
Atlasco	Aug.	11 On bottom	Lake Ontario	Upper works gone
Alice	Aug.	26 Squall	E. of Galveston	Sails torn
Alex. B. Uhrig	Aug.	29 Grounded	Big Point Sable light	Undamaged
Amassia	Aug.	30 Fire	New Orleans	Not stated
Ardeola	Aug.	4 Collision	Near Liverpool	Not stated
Asia	Aug.	30 Grounded in mud	Oakland	Not stated
Black Arrow	Aug.	11 Stranded	Cape Villano	Sunk
Barbarigo	July	6 Leaking	Massowah	To cargo
Bele	July	19 Stranded	Darkhead	Total loss
Bakara	July	20 Collision	Liverpool	Davits damaged
Bergensfjord	Aug.	11 Struck iceberg	Cape Race	Prop. bent
Bjarmia	Aug.	8 Collision	Princess Dock	Plates damaged
Broxvik	Aug.	2 Heavy weather	At sea	Stem broken
Bethlehem	Aug.	16 Grounded	Little Brase d'Orgut	Jettis. cargo
Boldon	Aug.	10 Collision	Blackwall Point	Slight
Baltannic	Aug.	10 Ashore	Worms Sound	Unknown
Bradclyde	Aug.	20 Grounded	Antwerp	Unknown
Bernice R	Aug.	20 Fire	At sea	Total loss
Barbara W	Sept.	2 Ashore	Block Island	Undamaged
Binghampton	July	19 Fire	Yarmouth	Total loss
Baltimore Maru	Sept.	5 Disabled	Norfolk	Boil. trouble
Beaverton	Aug.	16 Ashore	Below Alexandria Bay	Full of water
Brignagon	Aug.	17 Collision	Welland Canal	Not stated
Cerberus	Aug.	2 Fire	Not stated	Slight
Cuttyhunk	Aug.	4 Disabled	Bermuda	Boil. tubes leaking
Carlisle	Aug.	4 Disabled	Egg Harbor Inlet	Not stated
Cecilia Cohen	Aug.	7 Fire	Off Cape Hatteras	Sinking condition
Corona	Aug.	3 Grounded	Off Westbrook	Slight
Carla	Aug.	4 Collision	At sea	Plates dented
Canastota	Aug.	10 Missing	At sea	Not stated
City of Fairbury	Aug.	12 Disabled	Queenstown	Condenser leaky
Consort	Aug.	13 Disabled	New York	Turbine trouble
Cordoba	July	15 Grounded	Dakar	Prop. damaged
Cameronia	Aug.	8 Collision	Princess Dock	Undamaged
Cordillere	Aug.	22 Storm	Yangtse River	Total loss
Canadian Importer	Aug.	19 Disabled	At sea	Not stated
Canadian Recruit	Aug.	18 Collision	Below Quebec	Partly submerged
Canadian Warrior	Aug.	19 Grounded	Below Quebec	Slight
Columbia	Aug.	17 Collision	At sea	Heavy
Choctaw	Aug.	17 On rocks	Bayonne	Slight
Calimeris	Aug.	9 Explosion and fire	At sea	Sank
Chelosin	Aug.	11 Struck rock	Table Island	Slight
Chas. F. Crocker	Aug.	22 Gale	Port Townsend	Topmast lost
City of Vernon	Aug.	16 Disabled	London	Boil. trouble
Clement Smith	Aug.	9 Struck derrick boat	New Orleans	Prop. and bow damaged
Calcutta	Aug.	11 Heavy weather	At sea	Topmast lost
Chirripo	Aug.	21 Ran on rocks	Garston Docks	Unknown
Coelleda	Aug.	22 Disabled and grounded	Fort Carrol	Steerer trouble
Canadian Aviator	Aug.	28 Struck dock	Rouen	Stem damaged
City of Brunswick	Aug.	26 Ashore	Halifax	Not stated
Columbia	Aug.	27 Struck quay	Glasgow	Undamaged
City of Atlanta	Aug.	24 Disabled	Fore River	Plates dented
Comal	Aug.	26 Disabled	Norfolk	Mach. trouble

Name of Vessel	Date	Nature	Place	Damage Resulting
Clan Sutherland	Aug.	2 Fire	Fremantle	Not stated
Columbia	Aug.	17 Collision	Buenos Aires	Considerable
Cricket	Aug.	13 Grounded	Gray's Harbor	Undamaged
Con Rein	Aug.	30 Collision	Block Island	Sank
City of Vernon	Sept.	1 Disabled	At sea	Boils. disabled
Carl D. Bradley	Aug.	18 Grounded	Point Edward	Not stated
C. H. McCullough	Aug.	31 Grounded	Grand Pointe	Undamaged
Dagmar	July	23 Wrecked	At sea	Total loss
Duchess	July	29 Heavy weather	At sea	Dismasted
Duquesna	Aug.	15 Fire	Montevideo	Jettis. cargo
Deli	Aug.	2 Disabled	Gravesend	Not under control
Duchessa d'Aosta	Aug.	3 Disabled	Twofold Bay	Water in forepeak
Eustraties	July	20 Disabled	Mitylene	Prop. loose
Edith	Aug.	10 In distress	Charleston	Not stated
Elizabeth	July	25 Disabled	Holyhead	Machy. disabled
Eurana	Aug.	15 Disabled	At sea	Feed pumps broke
Eastern Admiral	Aug.	15 Disabled	Singapore	Steerer trouble
Edith Belliveau	Aug.	19 Heavy weather	Grand Anse	Lost anchors
Eole	Aug.	6 Struck dock	New York	Bow damaged
Eastern Glade	Aug.	23 Fire	Bahia Blanca	Not stated
Edith McIntyre	Aug.	12 Ashore	Tiners Point	Total loss
Euclid	Aug.	4 Collision	Liverpool	Considerable
Echo	July	12 Storm	At sea	Sails damaged
Eastern Admiral	Aug.	25 Disabled	Colombo	To feed pump and boil. valve
Earlscourt	Aug.	11 Collision	Near Havre	Plate damaged
East Cape	Sept.	2 Fire	Brooklyn	Considerable
Furthie	Aug.	2 Backed into rock	New York	Bent bulwark
Ferngarth	Aug.	15 Fire	At sea	Total loss
Florence B. Phillips	Aug.	19 Collision	Tompkinsville	Undamaged
Fishkill	Aug.	18 Disabled	Dry Tortugas	Boils. disabled
Frank D. Stout	Aug.	21 Grounded	Oakland	Not stated
Friendship	Aug.	27 Disabled	Philadelphia	Leak at rudder post
Guillem Sorrolla	Aug.	7 Grounded	Seville	Slight
Golden Gate	Aug.	7 On reef	East of Manzanillo	Not stated
Glaucus	Aug.	22 Grounded	Yangtse River	Not stated
Guinevere	Aug.	2 Ashore	Buzzards Bay	Slight
General Mine	Aug.	10 Struck Jetty	Barry	Slight
Gold Hunter	Aug.	24 Disabled	Thomaston, Me.	Leaking badly
Goole	Aug.	11 Collision	At sea	Slight
Gullfoss	Aug.	8 Fouled buoy and ship	Tyne	Not stated
George B. McKenzie	Aug.	21 Collision	Three-Mile Creek	Slight
Granite	Aug.	27 Collision	Low Point	Forepeak damaged
Genesta	July	29 Collision	Brown's Bank, N.S.	Sank
Henry L. Marshall	Aug.	1 Disabled	New York	Not stated
Hegira	Aug.	2 Disabled	Hamburg	Prop. blades lost
Helen Uphane	Aug.	11 Disabled	Norfolk	Prop. broken
Halesius	July	28 Fire	At sea	Slight
Hawkeye State	Aug.	18 Disabled	San Francisco	Minor repairs
Hatarana	Aug.	2 Fire	London	Unknown
Hendrik	Aug.	25 Grounded	Yangste bar	Not stated
Harriet	Aug.	29 Collision	Marcus Hook	Not stated
Hogland	Aug.	27 Grounded	Key West	Undamaged
Hermitage	Aug.	21 Collision	Three-Mile Creek	Bow damaged
Henry	Aug.	3 Disabled	Brest	Mast damaged
Isanti	Aug.	9 Disabled	North Arklow	Feed pumps disabled
Itonia	July	24 Fire	Venice	Slight
Josiah B. Chase	Aug.	15 Grounded	Rebecca Shoals	Leaking
Jex	Aug.	16 Sank	Lake Ontario	Not stated
James Timpson	Aug.	24 Disabled	Ambrose Channel	Not stated
Jed	Aug.	5 Ashore	Tousaint Island	Not stated
James Beard	Aug.	11 Sprung leak	Marysville	Sank
J. J. H. Brown	Aug.	20 Grounded	Chicago River	Not stated
Katherine Luckenbach	Aug.	4 Disabled	San Diego	Machy. disabled

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name of Vessel	Date	Nature	Place	Damage Resulting
Kentucky	July	20 Disabled	Havana	Feed pumps damaged
Kamouraska	Aug.	27 Collision	Low Point	Not stated
Liberator	Aug.	8 Disabled	Cape Henry	Prop. blade lost
Lady of Gaspe	Aug.	8 Struck shoal	Thrum Cap Shoals	Total loss
Lozere	July	17 Struck rock	Fedalah rock	Slight
Louise Howard	Aug.	14 Grounded	Beaufort Bar	Total loss
Lake Elmont	Aug.	18 Disabled	Brunswick	Eng. trouble
Leviathan	Aug.	24 Fire	Hoboken	Superstructure damaged
Lom	Aug.	22 Disabled	Wilmington	Pumps disabled
Lime Branch	Aug.	4 Struck quay wall	Dunkirk	Plates damaged
Lapad	Aug.	9 Disabled	Buenos Aires	Lost prop.
La Bourdonnais	Aug.	11 Collision	Near Havre	Undamaged
Lehigh	Aug.	17 Grounded	Wolf Island	Jettis. cargo
Minea Brea	Aug.	1 Tank leaking	Sorel	Lost gas.
Mount Vernon Bridge	Aug.	4 Disabled	Greenock	Pump trouble
Manuel L. Villaverde	July	12 Struck rock	Yorba Rock	Total loss
Maldonado	Aug.	4 Lost anchor	Near Hamburg	Recovered
Manchester Civilian	July	20 Collision	Liverpool	Davits damaged
Macabi	Aug.	10 Disabled	Boston	Not stated
Multnomah	Aug.	9 Disabled	Blunt's Reed	Prop. lost
Mary E. Hart	Aug.	8 Ashore	Seal Island	Leaking badly
Malmen	July	5 Disabled	Colombo	Condenser
Manipur	July	26 Collision	Suez Canal	Two plates dented
Maskinonge	Aug.	18 Collision	Below Quebec	Slight
Matthew S. Greer	Aug.	14 Disabled	Bermuda	Not stated
Matthew S. Greer	Sept.	6 Ashore	Comet Rock	Not stated
Milwaukee Bridge	Aug.	21 Grounded	Limfjord	Undamaged
Mystic	Aug.	16 Collision	Hamburg	Not stated
Mulpua	Aug.	23 Disabled	Ambrose Channel	Not stated
Mobile	Aug.	21 Collision	Three-Mile Creek	Not stated
Mississippi	Aug.	4 Disabled	New York	Machy. deranged
Merton Hall	Aug.	12 Struck obstacle	At sea	Stern leaking badly
Maindy Hill	Aug.	18 Disabled	At sea	Starboard bulwarks damaged
Melford Hall	Aug.	31 Collision	Staten Island	Plates and frame damaged
Monroe	Sept.	2 Disabled	Falmouth	Boil. tubes leaking
Mapleheath	Aug.	17 Collision	Welland Canal	Slight
Mercer Victory	Sept.	5 Disabled	Quebec	Stripped turbine
Naugus	July	22 Disabled	Off Formosa	Not stated
Newlands	July	21 Disabled	San Nicholas	Leak in tank top
North Land	Aug.	10 Disabled	Off Deer Island	Steerer trouble
Naldera	July	29 Collision	Bombay	Not stated
Northwester Miller	Aug.	21 Grounded	Brandywine Shoals	Not stated
Nellie Bywater	Aug.	9 Ashore	Holy Island	Bottom damaged
Nepos	Aug.	30 Damaged by crane	Jacksonville	To topmast, etc.
Northland	Sept.	2 Ashore	Rio Janiero	Heavy
Ottilie Fjord	Aug.	2 Grounded	Golden Gate	Not stated
Ovid	Aug.	10 Lost anchor and chain	Hampton Roads	Not stated
Onoria	July	19 Fire	South coast of Greece	Sank
Orlando	July	27 Struck dock	Lock Pit Royal Dock	Plate damaged
Oskaloosa	Aug.	24 Disabled	Near Southampton	Gear stripped
Old Charlton	Aug.	10 Collision	Blackwall Point	Slight
Polybius	Aug.	13 Disabled	Hampton Roads	Lost anchor and chain
Princess Edna	Aug.	14 Ashore	Goodyn Head	Not stated
Petroleine	Aug.	6 Disabled	Shields	Eng. trouble
Planter	Aug.	15 Gale	Key West	Sank
Patella	Aug.	17 Ashore	Portugal	Bottom damaged
Paris	Aug.	27 Fire	Havre	Slight
Quillwark	Aug.	3 Disabled	Halifax	Turbine trouble
Quernstad	Aug.	11 Ashore	Wulffs Island	Heavy
Queen Margaret	Aug.	3 Collision	St. Vincent	Bow damaged
Redondo	Aug.	4 Disabled	Seattle	Rudder damaged
Robin Hood	Aug.	11 Disabled	Cape Henry	Steerer trouble
Royal Transport	July	10 Ice field	St. of Belle Isle	Bow plates damaged
Rytoner	Aug.	8 Fouled by ship	Tyne	Slight
Rondo	Aug.	3 Collision	Rouen	Unknown
Ramscapelle	Aug.	6 Gale	Lundy Island	Water in hold
R. R. Richardson	Sept.	2 Grounded	Interstate Bridge	Undamaged
Saxonia	Aug.	3 Disabled	Cherbourg	Eng. trouble
Seine Maru	Aug.	2 Grounded	Near Astoria	Not stated
Sumatra Maru	Aug.	4 Fire	Perim	To cargo
Selene	July	19 Fire	Mozambique Channel	Abandoned
Saucon	Aug.	9 Disabled	Barbados	Boil. trouble
San Jose	Aug.	8 On reef	Pablo Reef	Hole in bottom
Sherman	Aug.	14 Leaking	Antofagasta	Not stated
Shoshu Maru	Aug.	15 Typhoon	Loochoo Islands	Total loss
Saucon	Aug.	9 Disabled	Barbados	Boil. trouble
Schuylkill Bridge	Aug.	17 Disabled	Cape Race	Eng. trouble
Siam Maru	Aug.	1 Disabled	Cape Guardafui	Not stated
Scotia	Aug.	8 Struck coal tip	Partington	Slight
Saxon	Aug.	16 Fire	At sea	Not stated
Sarnian	Aug.	29 Grounded	Lake Huron	Leaking badly
Scotia	Aug.	26 Fire	Drum Head	Total loss
St. Clair	Aug.	13 Fire	Alexandria	May be total loss
Sheaf Mead	Aug.	13 Grounded	River Plate	Leaking
Sophie Christensen	Aug.	21 Leaking	San Francisco	Jettis. cargo
Steadfast	Aug.	13 Struck quay wall	Havre	Not stated
Solana	Aug.	26 Damaged	Balboa	Not stated
Steel Age	Aug.	24 Disabled	Southampton	Eng. trouble
Samarinda	Aug.	23 Leaking	At sea	To cargo
Springfield	Aug.	22 Disabled	Gulf of Georgia	Rudder unmanageable
Solveig Skogland	Aug.	3 Collision	St. Vincent	Considerable
Sagaporack	Aug.	16 Disabled	Near Pernambuco	Boil. trouble
Samarinda	Aug.	31 Collision	Staten Island	Not stated
Sultana	Sept.	3 Ashore	Fox Point	Leaking
Scranton	Aug.	30 Tank punctured	Alpena	On bottom
Tosart	July	16 Collision	At sea	Undamaged
Tjisoondari	Aug.	19 Grounded	Portland, Oreg.	Undamaged
Tapti	Aug.	2 Struck coaling berth	Gibraltar	Stem damaged
Trawler No. 6	Aug.	15 Ashore	Point Pleasant	Not stated
T. K. Maher	Aug.	15 Disabled	Lake Michigan	Lost wheel
Tjikandi	Aug.	20 Fire	Glasgow	Slight
Villa de Casablanca	July	23 Sprang leak	Near Dellys	Sank
Vardulia	Aug.	7 Struck pierhead	Avonmouth	Plates damaged
V. C. Ricketts	Aug.	29 Ashore	Petote Island	Total loss
Whipple	Aug.	3 Disabled	Tampico	Eng. trouble
West Bridge	Aug.	11 Disabled	Brest	Lost prop. blade
West Lianga	Aug.	16 Disabled	At sea	Eng. trouble
West Kebar	Aug.	13 Anchor caught in buoy	Hamburg	Lost anchor
Waneta	Aug.	29 Collision	Marcus Hook	Sinking condition
Waukan	Aug.	26 Disabled	Gibraltar	Boil. trouble
West Ivan	Aug.	17 Disabled	Puget Sound Navy Yard	Defective rudder post
Western Knight	Aug.	30 Disabled	Honolulu	Eng. & boil. trouble
W. E. Corey	Aug.	4 Grounded	Port Huron	Jettis. cargo
Winyah	July	29 Disabled	Honolulu	Eng. trouble
Westmount	Sept.	2 Struck dock	Duluth	Damaged plate
Yarborough	July	20 Fire	Baltic Wharf	Unknown
Yomei Maru	Aug.	8 Struck dock	Barry	Bow damaged

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What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

GREAT BRITAIN'S policy of selling her government-owned ships, including the German ships which came under the British flag as the spoils of war, is working out quite advantageously. Of course the task is by no means as big a one as is faced by the United States shipping board, because before the great war Great Britain already had a very large privately owned merchant marine. These ships were carefully kept in the hands of their private owners throughout the war.

A large number of ships, however, were built by the government during the war and operated by the ministry of shipping. A large number were taken over from the Germans after the armistice. The task of disposing of this tonnage has from the start been in the hands of a competent shipowner, Lord Inchcape. The job of getting rid of these ships was tackled immediately after the armistice. At the present time there are only 14 ships left to be disposed of. These include the passenger steamers PRETORIA, PATRICIA, BERMUDA, BRANDENBURG, RUGIA, DANIA, LA PLATA and KISER; the cargo vessels BOSNIA, ANSWELD, ARTEMISIA, SCANDIA and SCHWARZENFELDS; also the PRINZ AUGUST WILHELM sunk in the harbor of Puerto. The sales of ex-enemy tonnage have included 104 passenger or cargo steamers, 14 sailing ships and 5 trawlers.

* * *

THE long drawn out joiners' strike in British shipyards is finally ended. It will be recalled that shipyard joiners in Great Britain went on strike in December, 1920, owing to the withdrawal by the employers of the war bonus of 12 shillings ($2.20) per week. The dispute has cost the Amalgamated Society of Woodworkers £500,000 ($1,825,000) in strike pay. These figures indicate the relative affluence of British trade unions, a wealth, however, which has been greatly diminished this year. The long shipyard joiners' strike resulted in very serious dislocation of work in British shipyards. A large number of vessels had to be sent to the continent to have their woodwork completed as a result of this strike which involved only about 10,000 men. It has now been settled on terms practically similar to those offered by the employers last December. In other words the men have accepted an immediate reduction of 6 shillings ($1.10) per week with provision for a further reduction of 3 shillings ($0.55) after October and the consideration of another reduction of 3 shillings ($0.55) in December.

* * *

VERY low prices continue to be quoted for ships in the British market. The British-built steamship MAPLEMORE, of 4330 gross tons and 7350 tons deadweight capacity, on a 23-foot draft, has been sold for £60,000 or under £14 ($51) per gross ton. The ex-German steamer AMASIS, 7224 gross tons, 11,850 tons deadweight capacity on a 26-foot 8-inch draft has been sold to Sota & Aznar, of London and Bilbao, for £65,000 or £9 ($32.50) per gross ton. She was built in 1914. Cory & Blundell, Cardiff, have purchased the Swedish built steamer MERCIA, 1100 tons deadweight, launched three weeks ago, for £14,000 ($51,000).

* * *

THE fire on the MAURETANIA, at Southampton, is likely to result in a serious claim on the insurance underwriters. This steamer is insured on a value of £1,900,000 ($6,950,000), and the owners pay the first £20,000 ($73,000) of any claim. This will, however, go only a small way toward the cost of repairing the vessel, for the cabin accommodation which has been destroyed is very costly. The famous liner was built in 1907, and is of 30,704 tons gross. At one time recently 20 guineas per cent was paid on the basis of paying "claims as original policy."

* * *

THE ex-German liner TIRPITZ, of 21,000 tons, has been bought by the Canadian Pacific Ocean Services, Ltd., and has left Immingham for Hamburg where she will be fitted for oil fuel. "We are taking her to Germany to be fitted because she has what is really experimental machinery," said Sir Thomas Fisher, general manager of the company. "She is the only ship afloat with turbines of an entirely new type for marine work, invented by a German named Fottingen." The TIRPITZ will be ready for sailings in April. Her name will be changed.

* * *

THE White Star line quadruple-screw steamship MAJESTIC, 56,000 tons, now nearing completion, will be the largest vessel in the world. She will take her place in the White Star line's mail and passenger service between Southampton, Cherbourg and New York next spring. With a length over all of 956 feet, a height from keel to boat deck of 102 feet and a breadth of over 100 feet, the MAJESTIC will have a gross tonnage of about 56,000, and a displacement of 64,000 tons when loaded to her marks. The turbine machinery will develop a maximum of 100,000 horsepower and it is intended that the MAJESTIC shall have an ample reserve to steam an average of 23 knots at sea. The rudder posts with plates will weigh 140 tons, and the stern post with the brackets for the four propeller shafts, will weigh more than 300 tons. The furnaces burn oil and the bunkers, originally designed for coal, have been adapted for oil.

Poland Buys Radio Plant

Representatives of the Radio Corp. of America and of the Polish ministry of posts and telegraphs recently signed the final contract which will insure for Poland an international high power radio station of modern type. The new plant will be near Warsaw, Poland, and it is estimated the complete project will cost about $3,000,000. The radio system to be used is that which has been standardized by the Radio corporation for transoceanic radio communication. The station will be equipped with two 200 kilowatt high frequency alternators built for the Radio corporation by the General Electric Co., and the transmitting aerial wires will be approximately two miles in length supported by 10 towers each 400 feet in height. It will have a normal radius of 4000 miles.

Costs Prevent Revival in British Shipbuilding

In the final debate on the safeguarding of industries bill in the British house of commons, J. Gould, speaking as a shipbuilder, said the price of steel had nothing to do with the conditions of the shipping industry, and no protective measures could affect it.

The position is due to the condition of labor, he said, and they could not by protective measure build up the industry until the men understood that steel must be produced on the same competitive level as in other countries

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and the workmen be prepared to give the same competitive labor as the man abroad.

The price in Great Britain of an 8000-ton ship, without any profit to the builder, was now £175,000. Before the war the price was £55,000.

Speaking on an amendment proposing to exempt from the act goods imported for the purpose of shipbuilding or ship repairing, Sir W. Raeburn said the existing slump in the shipbuilding trade was due to the fact there was now an excess of shipping compared with 1914, while there was less trade.

He did not think there was any chance for a revival in shipbuilding for some years to come, and therefore the supporters of the amendment need not bother about the shipping industry.

The amendment was defeated.

Scotch Shipyard Closes During Slump

Messrs. Yarrow & Co., Glasgow, Scotland shipbuilders, Aug. 12, posted the following notice in their works on the Clyde:

"Owing to repeated strikes, reduction of output and demarcation disputes which have taken place in various industries throughout the country, the cost of shipbuilding has become excessive, in addition to which it is impossible to promise dates of delivery.

"With the greatest regret, we have, therefore, decided to temporarily close our works, with the exception of our experimental and research department on or about Nov. 30.

"We shall reopen when conditions enable business to be carried on with some chance of success.

"We give this early notice of our decision so that our employes may have every opportunity of obtaining work elsewhere.

"After having distributed many millions of pounds in wages and built some of the fastest vessels afloat, it is with great regret that we have arrived at the above decision. We have great faith in the future of the shipbuilding and engineering industries in this country, and we believe that prosperity will return when everyone realizes that commercial undertakings can only be carried on with success in accordance with economic laws.

"So soon as these laws are recognized it will enable us to reopen our works, and, as in the past, take some share in future progress. In the meantime we shall continue our experimental and research work, so that the valuable information to be obtained will be available when we resume our full activities."

The American Ship & Commerce Corp., New York, has designated the American Ship & Commerce Navigation Corp. to execute the agreement that was made last year by the Harriman shipping interests and the Hamburg-American line for the joint maintenance of shipping routes. The new agreement is in the same form as the original which was made public last fall, and continues the terms then announced.

Sell Ships at Low Mark

Despite the unprecedented fall in ocean rates and trade depression resulting in several million tons of shipping lying idle, British sales of ships so far this year have been fairly numerous, according to a report to the department of commerce at Washington. The prices realized per ton have been smaller compared with those of the last two years. Altogether 58 trading steamers have been sold, of which 10 went to foreign buyers. In the following table, showing shipping sales during the first quarter of 1921, the vessels are classified according to tonnage:

Deadweight tons	Vessels	Total tonnage	Value
Under 1000	2	450	£7,750
1000 to 2000	7	10,520	145,600
2000 to 3000	6	13,707	134,000
3000 to 4000	4	13,750	125,000
4000 to 5000	10	43,117	374,000
5000 to 6000	2	11,790	70,500
6000 to 7000	11	70,740	526,500
7000 to 8000	6	45,507	415,500
8000 to 9000	6	50,291	1,349,000
9000 to 10,000	2	19,100	275,000
Over 10,000	2	23,700	350,000
Total	58	302,672	3,772,850

These figures show that an average price of £12 9 shillings 3 pence per ton, deadweight, was paid as compared with prices of the previous two years ranging from £40 to £50 per ton. Approximately all of the steamers sold are of quite recent construction, so that this average price per ton represents fairly the market value of up-to-date British shipping tonnage.

The amount realized from the sale of these 58 ships is the smallest of any preceding quarter except the third quarter of 1920. In view of the present trade depression sellers of ships feel that it is the time to realize, and that they will never get a similar opportunity. In the meantime, holders of shipping and purchasers alike are having great difficulty in earning any return on money invested.

The trade in steamers sold during the first quarter of 1921 may be summarized as follows, in accordance with the prices paid per deadweight ton:

	Vessels
Under £5 per ton	8
From £5 to £10 per ton	23
From £10 to £15 per ton	15
From £15 to £20 per ton	5
Above £20 per ton	3

These last three steamers, which were of recent construction, realized £37 8 shillings £28 11 shillings and £38 11 shillings per ton, respectively. Comparison of these prices with prices paid in 1920 and 1919 for old steamers shows a remarkable contrast. The average price per ton during the last nine quarters has been as follows:

	£	s	d
1921:			
First quarter	12	9	3
1920:			
Fourth quarter	24	16	11
Third quarter	25	2	4
Second quarter	30	19	5
First quarter	27	7	3
1919:			
Fourth quarter	29	4	1
Third quarter	26	18	11
Second quarter	20	18	2
First quarter	20	3	4

The British government has made every effort to sell the ex-enemy ships. The depressing effect on the shipbuilding industry and on shipping values generally of this attempt to dump cannot be overestimated. For every ex-enemy steamer sold is meant the loss of an order sooner or later for British shipbuilders. At the end of October, 1920, 24 ex-enemy passenger steamers and 30 cargo steamers were advertised for sale. Of these steamers 16 were built 20 years or more ago. A few days ago it was announced that 10 of the passenger steamers and 9 of the cargo steamers were still unsold. The passenger steamers sold include the BISMARCK, of 56,000 tons, built in 1920, and the IMPERATOR, 51,969 gross tonnage, built in 1912, but the prices obtained have never been made public. The cargo steamers range from 12,000 deadweight tonnage to 2000. Two of them were built as recently as 1915 and several others in 1914, 1913, and 1912.

Rebuild Big Liner in Record Time

In the September issue, MARINE REVIEW presented the first photographs taken of the big American liner GEORGE WASHINGTON after she was recommissioned for high class transatlantic passenger trade. The photographs were obtained from the Todd Shipyards Corp., New York, the refitting of the big liner having been done at the Tietjen & Lang plant of this company. The yard completed a rather remarkable record in handling this big contract. European builders stated that no American plant could complete the work within nine months while the best European estimate was six months. The Todd company easily finished its work in far less time than the best European estimate. In addition, the character of the work done has been such as to draw approval from all shipbuilders and shipowners who have inspected the refitted vessel.

At present several vessels are repairing and outfitting in the Tyne for a London company. These ships are intended for trading in the Arctic regions. They are ships of between 2500 and 4000 tons.

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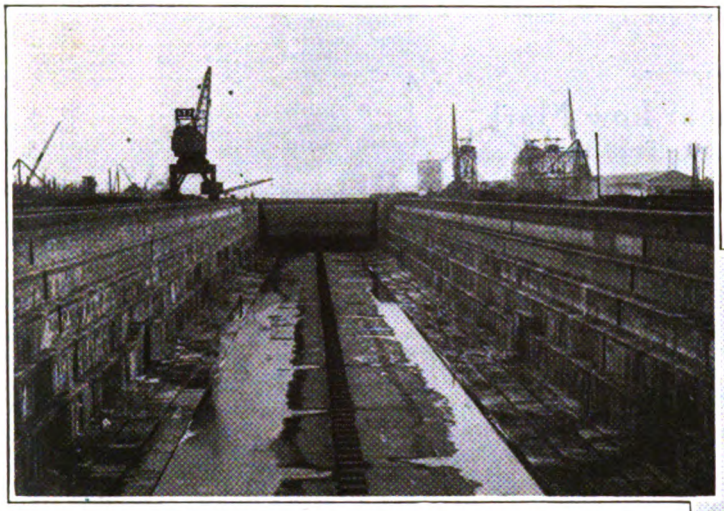
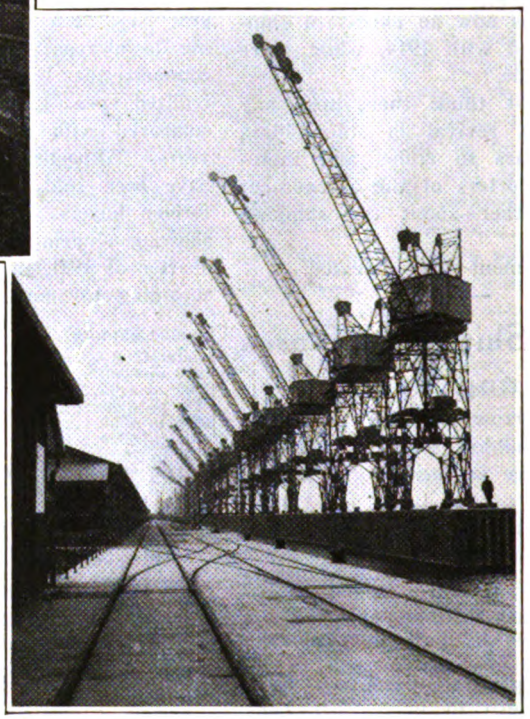
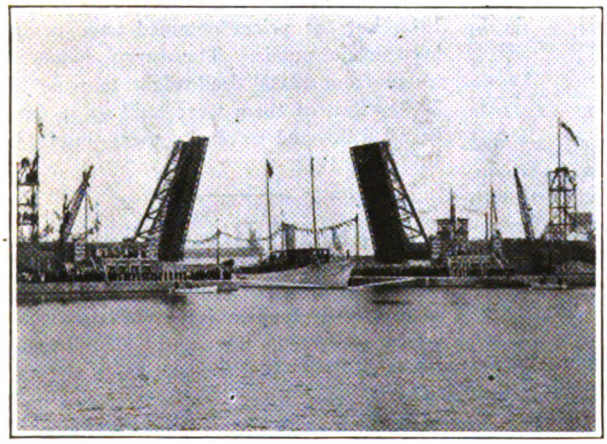
Photographs from Far and Near



The new drydock of the extension to the Royal Albert dock, London, is 750 feet long, 100 feet wide and 35 feet deep

The new deep-water dock of 65 acres, adjacent to the Royal Albert dock, and recently opened by the king of England is the largest of its kind in the port of London. Below are shown some of the cranes serving the dock

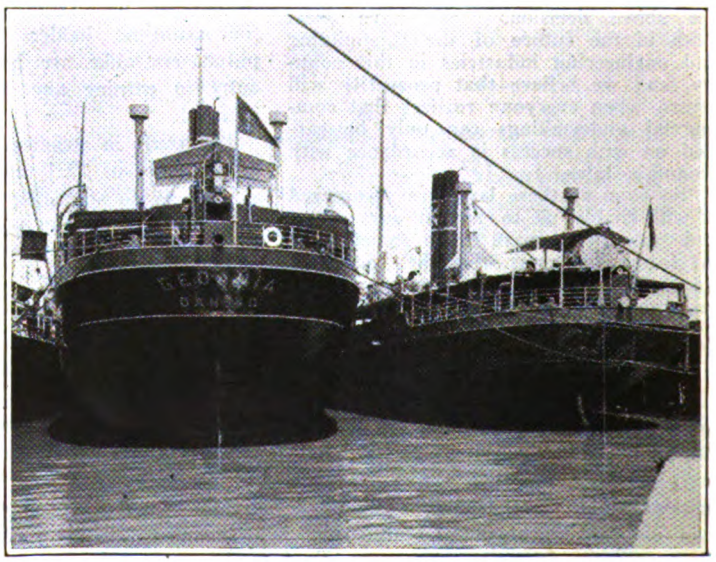




The king and queen and members of the royal family opened the extension of the Royal Albert dock when their yacht, Rover, broke through a silken cord stretched across the entrance

Steamers Gedania and Vistula, first from the internationalized port of Danzig to visit the port of New Orleans. They are now in the oil trade between the United States and Mexico, and they put in at New Orleans for repairs

Motorship Ardito built in Italy and owned by La Platense, Societa Anonima Marittima. The ship has a displacement of 13,000 tons, is of 8500 tons deadweight, and has diesel engines of 3000 horsepower



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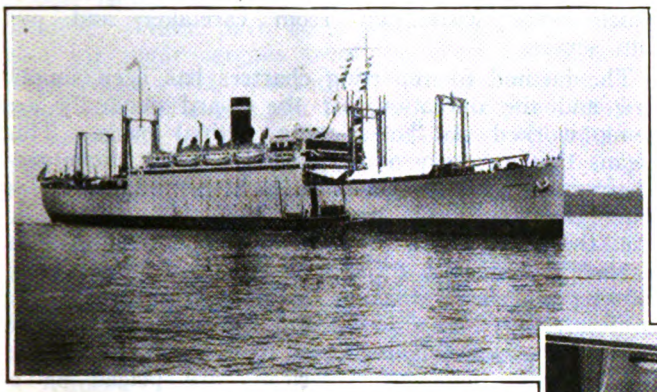
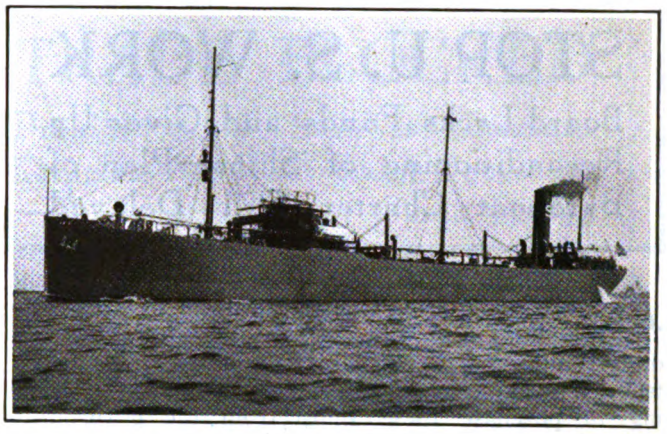
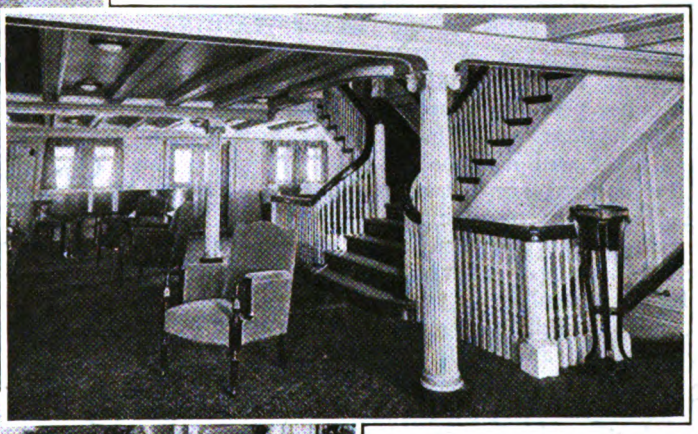
Latest Marine News in Pictures

The American Legion, shown below, was built recently by the New York Shipbuilding Corp. for the United States shipping board and allocated for operation to the Munson line. It is now in passenger service between New York and South American ports





The oil tanker Yankee Arrow, built for the Standard Transportation Co. by the New York Shipbuilding Corp., has a capacity for carrying 3,500,000 gallons. The overall dimensions are: Length, 485 feet; beam, 62 feet, 6 inches and depth 39 feet, 6 inches



The American Legion is handsomely furnished for first-class passenger service. The vessel measures 535 feet over all and has a beam of 72 feet

The American Legion has accommodations for 280 first-class passengers, and 194 third-class. The ship has a speed of 17½ knots

A golf meter is one of the many features of interest on board the Taiyo Maru operated by Toyo Kisen Kaisha between San Francisco and Hong Kong. This vessel was built by the Hamburg South American Co. but was awarded to the Japanese government by the reparations commission. A 6-hour "sample cruise" for a select party marked its introduction at San Francisco

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World Charter Market Reviewed b

STOP U. S. WORK

Board Lacks Funds and Gives Up Reconditioning of Ships—Plan of Bareboat Charter Still Delayed

ANOTHER effort now is to be made to build up a steamship company which will not only operate the GEORGE WASHINGTON and the other ex-enemy passenger boats in the transatlantic trade, but a company with sufficient financial backing to purchase these ships from the government and take that part of the fleet out of the hands of the shipping board. Temporarily, at least, the old United States Mail line boats will be operated for the account of the board by a joint committee representing the Harriman, Clegg and McCormick interests. Called the United States line, the eight passenger boats will be continued upon their advertised schedules. The going ships are the GEORGE WASHINGTON, AMERICA, PRINCESS MATOIKA, POTOMAC, CENTENNIAL STATE, HUDSON and OLD NORTH STATE. In addition, the plans for reconditioning the SUSQUEHANNA, AGAMEMNON, MOUNT VERNON and PRESIDENT GRANT will now be rushed.

During the controversy between Chairman Lasker and the Mayer family regarding the new U. S. Mail line, many charges and counter charges were made, but these have no bearing whatever upon the main contention. It is undoubtedly the desire of the new shipping board to sell the government fleet at the best price possible and a sale of these passenger ships was impossible so long as the Mayers' charter held good. Before it is possible to sell the ships, the Mayers had to be removed and that has now been accomplished. Congress is also working in line with the obvious policy of Chairman Lasker and is showing greater reluctance to appropriate for the government fleet. Only $48,500,000 was appropriated for the cost of operations for the remainder of the year. This change comes in this day of the destructive shipping slump, when all lines are drawing upon the surpluses they have built up to tide themselves over.

Low Funds May Force Sales

This curtailment of appropriations made it necessary to stop all reconditioning of ships on the part of the board. The plans to put the LEVIATHAN back in service now are impossible of execution. Desperate efforts have been made to sell the total wooden fleet and a great number of the ex-enemy vessels. Without doubt some constructive sales will be made in the not distant future. Also the board has indicated that it would stop immediately all services which were not paying. This means that the foreign feeder services will be stopped and American ships maintained in foreign coastwise trade for these services will be brought home. Most of these ships have, at any rate, been unfitted for the work assigned them. Competing services maintained with government ships will be stopped. And finally, it is the announced intention of the board to work out a new operating agreement whereby the expenses of operating will be borne by the private operators who handle the government boats. Bareboat chartering, as is now contemplated, undoubtedly will result in tieing up a greater proportion of the fleet, but it will check the waste of government expenditure. This is difficult to work out immediately and because of it the board during the past month allocated upon the old principle a total of 29 ships, representing 190,437 deadweight tons, which were withdrawn from caretaker and put into service.

The method of reporting charters has been simplified and the operations of the board generally are being worked out to a more normal basis. This means that an army of employes is being discharged. Chairman Lasker promises to have his own troubles with congress over patronage in this connection. But the deletion of deadwood among employes is a general order of the day. The private steamship owners have been working down their manning scale until now it is on a basis with the British merchant ships. The scale, it is hoped, will be worked down still further until the Americans are placed on a parity with the Norwegians.

Costs Still Are Far from Normal

Shipping costs are nowhere near normal as yet and trouble is still threatened with labor. It is reported that Valparaiso is tied up because of the radical labor elements there. At the same time there is no appreciable improvement in traffic, although some slight signs of betterment can be recognized on one or two lines. Russian relief will not require any large amount of tonnage. First surplus stocks in Europe will be used and then when shipments from this side of the Atlantic are necessary they will be booked on regular liners. Improvement in the Oriental markets is being reflected to a slight degree in the ports of the Atlantic. Some future business is expected. The re-establishment of export rates by the American railroads has given some encouragement to this optimistic feeling. The Levant trade is expected to pick up in view of the relief which is expected to move via Black Sea ports. The rates in this trade were re-

New Paris Office

REMOVAL of the Paris, France, office of the Penton Publishing Co., to 224 Rue de Rivoli has just been completed. This company in addition to MARINE REVIEW, publishes *The Iron Trade Review, Daily Metal Trade, Foundry, Power Boating* and *Abrasive Industry*. Francis Miltoun Mansfield continues in charge of this office under the direction of H. Cole Estep, European manager for the Penton organization. As a pioneer in in the establishment of a Paris branch office, MARINE REVIEW is naturally gratified over the growth which has compelled the opening of larger offices. The new facilities are available for any of our patrons.

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cently slashed as a result of keen foreign competition. Manufactured articles have been noticeably lacking in the cargoes of vessels loading on the Atlantic seaboard. In those trade which are moving any quantity of freight both ways, the outgoing cargo is about 90 per cent foodstuffs and the inward is composed of raw materials. The movement of commodities from Brazil and the River Plate to the United States and England has been showing a constant improvement. Lumber to River Plate has been booked at about $15. The movement has been slow. There have been some inquiries in the market for sugar cargoes from the West Indies and it is expected a fair demand for tonnage will be in evidence shortly from Cuba to Europe. British ships have been cutting under the coal rates to South America.

Rates to Porto Rico have been reduced approximately 10 per cent. Considerable dissatisfaction is said to exist among the members of the West Indies conference. Westbound cargoes in the intercoastal trade improved somewhat during August. Rates on grain out of Gulf ports have been reduced to European destinations. Eastbound transatlantic passenger fares were reduced Sept. 1. A cut of $30 in the minimum first class fare to Hamburg was announced by the Royal Mail Steam Packet Co.

American Lines Plans Mature

Earnings of the Atlantic, Gulf and West Indies steamship lines during the first six months of the current year, exclusive of its oil subsidiary were in excess of a million and a quarter dollars. The International Mercantile Marine will this year earn something in excess of its 6 per cent dividend on its preferred stock. It would appear from this the more solidly intrenched American companies are not registering losses despite the tremendous shipping slump. The International Mercantile Marine has sold the old American liner NEW YORK to the Polish Navigation Co. which will have her reconditioned and placed in service between New York and Danzig. The American liner ST. LOUIS was sold to the Anderson Overseas Corp., which will offer her for a commercial selling tour of the world. The American line, it is said, will probably shortly sell the PHILADELPHIA, the Polish Navigation Co. being interested in the vessel. The Black Star line, a negro shipping corporation, has purchased the ORION from the shipping board for $225,000. This ship has first and second class passenger accommodations and it is expected the new owners will run her in the West Indies and west coast of Africa trade, including Monrovia. The Norton line advertised bookings on the American mail steamer CROFTON HALL for Buenos Aires, sailing Sept. 15. This line, due to the slump in South American business, previously had not booked since the latter part of May.

60 Per Cent Now Idle

WHEN the new shipping board placed three practical operators in charge two months ago, 694 government vessels were idle. Now 842—more than 60 per cent of the federal fleet—are laid up. Only 470 steel freighters are in service. This follows the decision to cut down expenses by taking off losing ships from routes oversupplied with tonnage. A related curtailment has been the reduction in the number of operators. Plans now being announced show that the different routes will be handled by one or two operators instead of a larger number. The old plan brought about heavy losses. Further cuts in number of ships and operators are planned.

TRADE BLOCKED

Prohibition of Lumber Charters Cripples All West Coast Operators —Trade with Orient Gains Power

Among the Foreign Operators

The New York Sydney Steamship line, backed by American and Australian interests, starts a general cargo service from New York to Australia this month with the British steamer BLOSSOM HEATH. The French line this month starts a monthly freight service from Bordeaux to San Francisco via the Panama canal. Owing to the immigration restrictions in the United States, the Italian lines are being diverted to Canadian ports. The Navigazione Generale Italiana has decided to open a direct line between Naples and Quebec.

The Cunard line has decided to convert the MAURETANIA to an oil burner. This ship is temporarily out of service owing to having been damaged recently by fire. The new medium liner SCYTHIA of the Cunard line arrived at New York recently on her first trip. This liner is considered the most modern expression on the part of the British of what a transatlantic liner should be. The Holland American line has started the construction of the STATENDAM, a 32,000-ton passenger steamer. This ship will hold the record of being the largest Dutch ship afloat. The vessel is being built in Belfast. The White Star line announces the MAJESTIC will be put in service next spring. This ship will measure 56,000 tons and will be the largest vessel ever built.

A new steamship company is being organized at Guayaquil. Ecuador, to engage solely in the fruit trade between that country and the United States. It is expected deliveries will be made at Gulf and Atlantic ports. Cia de Navigation Viajera Antillane of Havana is starting a new freight service from Antwerp to West Indian ports. The Hamburg-American line to Cuba and Mexico from Antwerp is to be resumed. It is reported a Spanish-American line is to be established next year by interests in Spain.

It is reported that a weekly steamship service from Stettin, via Hamburg, to North Africa, Greece, Syria and Alexandria will be established by the Orient line, a new concern of Stettin. The steamers of the line will fly the Danzig flag. The Adria Societa Anonima de Navigazione Maritima have established a service from Antwerp to Mediterranean ports. Negotiations are said to be underway to re-establish the freight

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services at Antwerp formerly maintained by the Koshios, Deutsche-Australische and Roland line. These companies made Antwerp a regular port of call before the European war.

Board's Policy Confuses

Charter conditions at north Pacific ports show a firm demand for steam tonnage and a general depression in the sailing ship market. Uncertainty as to the shipping board policy has created confusion in the Oriental situation and both shippers and operators are unsettled. Freights to the Far East have firmed slightly and there is a feeling that with space scarce the westbound level is likely to advance further. Two developments of recent date have featured the charter market in the Pacific section: The shipping board has ordered all operators to cease booking lumber cargoes for the Orient and the westbound Pacific conference, including British Columbia and Puget Sound lines, has been dissolved.

Since July 1 the rate on lumber to the Orient has been firm at $12.50 and while the Puget Sound conference established a differential for logs and large timbers, the Portland operators refused to agree to this higher rate. The position of the shipping board is that it is losing too much money in freighting lumber at a $12.50 level, which caused the recent order.

The northern conference decided to quit on Aug. 15 following disagreement among operators and the refusal of Columbia river lines to co-operate with the northern companies. The demand for space is so keen that the absence of the conference has had no immediate affect and conference rates as a rule are still being maintained. Some tramp tonnage has been booked for surplus Oriental offerings but there seems no danger of a rate war.

Lines operating from Seattle to the Orient are practically booked full for two months in advance. The demand for space continues active, lumber especially moving in large quantities. Japan is buying considerable wheat and this is also giving the water lines additional cargo. The steel rate to the Orient has been cut from $5.88 to $5 per ton and cotton from 50 cents to 35 cents per 100 pounds. Wheat and flour are moving on a basis of $6 per short ton while the new rate on lumber is conservatively $13.50 with higher rates for extra sizes.

In the intercoastal route, business is increasing in both directions, recent adjustments of commodity rates having stimulated a steady flow of freight. Lumber is not moving in such volume as several months ago but canned goods are taking up much steamship space.

Considerable activity has been noted in the chartering of steam tonnage for grain from the west coast to United Kingdom and the continent. The present level is around 60 shillings but the rate has fluctuated in sympathy with the rise and fall of sterling and the condition of the grain markets in European centers. Foreign ships are getting practically all of this business. Early in August charters were made at 65 shillings and up but the market has since declined and a foreign ship was recently offered at 57 shillings 6 pence.

The movement of lumber to the Hawaiian islands has temporarily declined but it is expected to come back soon. Sail tonnage is available at $12.50 but the demand is inactive. The steamer rate on lumber to the islands continues firm at $15.

The Australian market for lumber is extremely weak. The conference rate has just been cut from $20 to $18 with special contract for lots of more than 1,000,000 feet. This places sailing vessels practically on a $15 level at which owners claim they can not operate. Several charters for Australia have recently been made but at exceptionally low rates. A foreign steamer was taken on a basis of $17.50, Canadian exchange.

In the coastwise business the lumber demand has eased off but rates are about $8.50 to San Francisco and $9.50 to San Pedro with a charter now and then at 50 cents under these levels.

Grain Diversion Hits Port

Along with other eastern ports, Boston has suffered through the diversion of grain to the Gulf and to Montreal. The continued depression has also reduced greatly general export cargo, especially machine tools and machinery, which formerly formed an appreciable part of the midsummer traffic through the port of Boston. During the past month nearly all services out of Boston showed a decline in tonnage moving. For the most part, sailings have continued close to schedule but cargoes have been light. The service to Black Sea ports has shown some improvement. This is traceable to large refined sugar cargoes exported the first part of September. One vessel carried a cargo of 4400 tons of sugar for Piraeus, Greece. Scandinavian and Great Britain lines have practically held their own throughout the month, although traffic is exceptionally light.

Service from Boston to the Pacific coast continues along encouraging lines, but trade between all eastern ports and South America has fallen off sharply. With the tieing up of the WEST JAFFRE, John S. Emery & Co. have discontinued their service between Boston, Philadelphia, and the east coast of South America. The reduction in freight rates on grain, which went into effect in August, has not as yet been reflected in north Atlantic trade. The grain movement, however, through Montreal is exceptionally heavy, and the three Boston lines operating boats from there report favorable conditions both in grain and general cargo. The port in fact, has been over-crowded recently, and both shipping board and private vessels have had to wait from 8 to 10 days before docking.

Freight rates have dropped off gradually until now grain rates are at a point where many shippers have lost interest in soliciting tonnage. The eastern conference governing bulk cargo rates has been abolished and decisions are now made by the shipping board direct. This is primarily an economy and so far has had little or no effect on rates. Effective Sept. 24 reductions are made on storage rates on imports entering Boston, and also on carload lots of export freight for trans-shipment.

Gulf Market Is Quiet

With grain the only active cargo, the New Orleans market for steamship charters remained rather quiet during August. Germany rapidly is becoming a heavy buyer of wheat, flour and other foodstuffs but, like other markets, is hampered by her inability to negotiate suitable credits. This business, however, together with prospects that a great deal of American cereals will be booked for continental Europe and possibly Russian relief work, stimulates the hope that the demand for charters will soon broaden out. Merchants returning from Greece

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Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Sept, 8, 1921, on Future Loadings

New York to	Grain	Provisions	Cotton (H.D.)	Flour	General Cargo cu. ft.	General Cargo 100 lbs.	††Finished steel	Coal from Virginia cities
Liverpool	$0.21	$0.75	$0.42½	$0.26	$0.45	$0.85	$ 8.00T	....
London	0.21	0.75	0.42½	0.26	0.45	0.85	8.00T	....
Christiania	0.30	0.50	0.72½	0.35	0.55	1.00	10.00T	$5.00T
Copenhagen	0.30	0.50	0.72½	0.35	0.55	1.00	10.00T	5.00T
Hamburg	0.25	0.55	0.35	0.30	0.45	0.82½	9.00T	4.25T
Bremen	0.25	0.55	0.55	0.30	0.45	0.82½	9.00T	4.25T
Rotterdam	0.22½	0.50	0.35	0.27½	0.40	0.75	8.00T	4.00T
Antwerp	0.22½	0.50	0.35	0.27½	0.40	0.75	8.00T	4.00T
Havre	0.22½	0.50	0.35	0.27½	0.40	0.75	8.00T	4.25T
Bordeaux	0.22½	0.50	0.35	0.27½	0.40	0.75	8.00T	4.25T
Barcelona	0.30	20.00T	0.82½	0.65	—20.00T—		12.00T	4.25T
Lisbon	0.30	20.00T	0.82½	0.65	—20.00T—		12.00T	4.25T
Marseilles	0.30	0.75	1.00	0.40	—20.00T—		10.00T	4.50T
Genoa	0.25	0.75	0.75	0.50	0.50	1.00	9.00T	4.50T
Naples	0.25	0.75	0.75	0.50	0.50	1.00	9.00T	4.50T
Constantinople	0.26	15.00T	0.75	0.31	—22.00T—		15.00T	5.75T
Alexandria	0.26	15.00T	....	0.31	—22.00T—		15.00T	5.75T
Algiers	....	25.00T	....	0.40	—25.00T—		12.00T	4.50T
Dakar	....	23.00T	....	23.00T	—23.00T—		20.00T	....
Capetown	18.00T	23.00T	....	18.00T	—23.00T—		15.00T	....
Buenos Aires	....	....	....	....	—20.00T—†		12.00T†	3.75T
Rio de Janeiro	....	....	....	....	—22.50T—†		16.50T†	3.50T
Pernambuco	....	....	....	....	—23.50T—†		17.50T†	4.00T
Havana	0.44½*	0.50*	....	0.44½*	0.47*	0.94*	0.44½*	1.75T
Vera Cruz	....	0.70	....	0.50	0.45	0.90	0.60	2.00T
Valparaiso	....	1.25	1.16	1.00	0.70	1.25	14.00T	4.75T
San Francisco	....	0.75	....	0.85	....	....	0.75	....
Sydney	....	....	....	....	25.00	30.00T	15.00T	....
Calcutta	....	21.00T	....	....	—21.00T—		18.00T	....

T—ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfage.

From North Pacific Ports to	Lumber Per M. ft.
San Francisco	$8.00 to 8.50
South California	9.00
Hawaiian Islands	12.50 to 15.00
New Zealand	15.00 to 18.00
Sydney	18.00 to 20.00
Melbourne-Adelaide	20.00 to 22.50
Oriental ports	13.00 to 17.50
Peru-Chile	18.00 to 20.00
South Africa	30.00 to 32.50
Cuba	20.00
United Kingdom	150s
United Kingdom (ties)	125s
New York	17.00 to 20.00
New York (ties)	18.00
Buenos Aires	17.00

	Flour and Wheat
Oriental ports	$6.00T
United Kingdom	60s to 65sT
Scandinavia	60s to 65sT
Mediterranean	63s to 65sT
	Steel
Oriental ports	$ 5.00T
	Cotton
Oriental ports	$ 7.00T

Principal Rates To and From United Kingdom

	s	d
Grain, River Plate to United Kingdom	27	6
Coal, South Wales to Near East	16	0
Coal, Newcastle to France	7	9
Coal, South Wales to Buenos Aires	14	0
Iron ore, Bilboa to Middlesborough	7	6
General British market, six months time charters, per ton per month	6	0

Bunker Prices

	At New York: Coal alongside per ton	Fuel oil 16 baume per barrel	Diesel oil gravity 25-30 per gallon		At Philadelphia: Coal per ton	Fuel oil 16 baume per barrel	Diesel oil gravity 25-30 per gallon
Jan. 8	$7.00	$2.94	10 cents	Jan. 10	$9.45	$2.08	.....
Apr. 6	6.40 @ 6.75	1.95	6.5 cents	Apr. 7	5.75 @ 6.00	1.98	5.7 cents
July 8	5.75 @ 6.25	1.45	4.25 @ 5.25 cents	July 7	4.90 @ 5.45	1.47½	4.5 cents
Aug. 5	5.75 @ 6.25	1.45	4.25 @ 5.25 cents	Aug. 9	5.05 @ 5.40	1.37	3.75 cents
Sept. 7	5.85 @ 6.20	1.45	4.25 @ 5.25 cents	Sept. 6	5.65 @ 6.05	1.47½	4.25 cents

Other Ports

Boston coal, per ton	$9.00
Boston, oil, per gallon	1.25
Cardiff, coal, per ton	30s
London, coal, per ton	40s
Antwerp, coal, per ton	45s

are optimistic over the outlook there and predict that as soon as the war with Turkey terminates the American exporter will have an excellent chance to place goods in that quarter. In Italy a growing sentiment is reported to be in favor of American products when all other considerations are equal. Latin American prospects for business, however, are not considered so bright and reports continue of active foreign competition, accentuated by a feeling of resentment against American exporters.

Some of the late August grain charters reported out of New Orleans included: British steamship DACRE CASTLE, 32,000 quarters, Gulf to the continent, 25 cents early in September; British steamship BUCHANNES, 28,000 quarters, Gulf to Rotterdam, 24 cents August; British steamship PORTLOE, 30,000 quarters, Gulf to United Kingdom or continent, 6 shillings 10½ pence August; steamship PESCO, Gulf to Mediterranean, one port, 6 shillings 9 pence; two ports, 7 shillings August-September; and for lumber, the Dutch steamer HAGNO, 2132 tons, Gulf to the River Plate, at or about $18, September.

In the sail tonnage market a few inquiries were reported for small cargoes of coal for the West Indies. Some ties were fixed from Florida to north of Cape Hatteras and here and there a lumber cargo was closed for Cuba or Porto Rico. Rates have been in keeping with the large amount of tonnage offering.

P. Kleppe & Co., Inc., are the agents for a service being established between New Orleans and Buenos Aires with Norwegian flag ships. These vessels will fly the house flag of the North & South line. The same agents will establish a service between New Orleans and ports in Mexico.

Coal Exports Boost British Market

From Our European Manager

London, Sept. 12 (By Cable)—British coal mines exported in August more than 3,000,000 tons, a total nearly double the export movement in August of last year. As a result industrial conditions are healthier. British ship owners believe the worst of the slump is past although freight rates remain at the extremely low level. The rate on grain from the River Plate has declined another 15 shillings. Grain tonnage from Baltimore to the United Kingdom has been chartered at 19 cents per 100 pounds, the lowest figures made in many years. Inquiry for trade with the Near East is fair while in the Baltic service, business is more active.

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Editorial

Bargains on Display

BY OCT. 1, at the Staten Island, N. Y., anchorage, 264 shipping board vessels are to be tied up. New arrivals are being anchored daily. With such a fleet only a few miles from the country's greatest port, the biggest marine bargain sale in history should be held without delay or difficulty. For number and variety of selection, the anchorage will rival a department store.

Sales should be merely a question of accepting responsible bids, instead of the past policy of haggling over price. No sale price should be too low to warrant rejection, as it would remove one more item of expense from the board's criminally ruinous costs of today. In the meantime the expense of maintaining the ships in "ordinary" is eating their heads off.

Still Willing To Let George Do It

THE Cincinnati chamber of commerce is not in sympathy with the economy policy of the new shipping board. By formal resolution, the chamber reveals its belief that the kind of publicity recently originating from the shipping board is undermining confidence and lessening the spirit of co-operation. The chamber favors continued substantial backing by the government, maintenance and establishment of trade routes and full enforcement of the Jones merchant marine act.

The definite suggestion is made by the chamber that the National Merchant Marine association take up the work of enlisting the concerted aid of business organizations throughout the country in demanding the maintenance of present routes. Cause for action is evidenced by the knowledge that the shipping board, if it carries out its announced plans, will necessarily lay up many of its vessels until a business revival leads private operators to employ the vessels.

How the present uneconomic policy of piling up a daily cost to taxpayers of one million dollars, can be construed as helpful to the industrial, agricultural or any other element of American commercial life, is difficult to visualize. Even the wealthiest government in the world must bow to the inexorable compulsion of economic common sense. No nation can win maritime independence by putting a premium on inefficiency. The Cincinnati—as well as other business organizations—will start toward the real solution when they give up the idea of letting the government do the worrying and instead encourage the investment by local capital in ships which the government must sell.

When Are the Ships To Be Sold?

THE definite shipping policy is long overdue. The new shipping board, under the leadership of Mr. Lasker, has functioned so much better than any of its predecessors that words of criticism have been checked. But is it not time for a little action?

Sales of ships are no more abundant than before, and yet getting out of business was to be a fundamental principle of the new board. It is most certainly the battlecry of the whole nation that the shipping wastage be stopped and the wreckage tossed overboard.

The wooden ships, according to announcement of several months ago, were all to be gone Oct. 1. Responsible offers for other ships were to be accepted without delay. The LEVIATHAN case was to be settled weeks ago.

Who has ever successfully disputed the suggestion made in these columns months ago that the ships could be sold? Our recommendation is that they be auctioned off. Demonstration and advertisement all over the world that the ships are to be sold by auction, block by block, week by week, Americans preferred, will bring out bids. But a monotonous submission of bids, time after time, only to have the whole lot discarded and another "sale" announced disgusts the buyers and causes lack of faith in the government's honesty of purpose.

Side issues such as the bareboat charter plan are worth study as long as they promise to stop financial losses. But why not start now on the long road of selling all the ships by beginning to sell a few of them at regular intervals.

England sold her ships first to her own people, and then to Germany. But the important fact she proved is that the ships could be sold.

Big Crop But U. S. Boats Still Idle

ALTHOUGH Puget Sound and the Columbia river will export during the coming season the largest amount of wheat ever shipped in one season from the north Pacific, Uncle Sam's new merchant marine is not getting its share of this unprecedented movement.

The wheat crop of the great Inland Empire, comprising portions of Oregon, Washington and Idaho is estimated at 80,000,000 bushels this year, the greatest yield on record. It is expected that at least half of this total will be shipped out of Seattle, Tacoma, Astoria and Portland. Exporters are now making their charters for the season but foreign carriers are getting the business. Since July 1, about 40 steamers of 300,000 tons capacity have been fixed for Puget sound or Columbia river loading. Of this great fleet of carriers, 24 are Japanese, 14 fly the British flag and 3 are shipping board vessels.

The same conditions apply to the movement of Washington's great apple crop which is expected to bring $50,000,000 into that state. Shippers are booking space for offshore markets but practically all the exports of this fruit is to move in foreign vessels because foreign lines provide refrigerated space while it is rarely the case that cooled space can be found on an American carrier.

These conditions have naturally brought up the question why American ships are not carrying American products from North Pacific ports. The answer seems to be that American ships can not, or are not permitted to, compete for business on equal terms with their foreign rivals.

To illustrate: The wheat exporter seeks tonnage for his grain. The rate fluctuates from day to day being influenced by many factors such as the price of sterling, the demand for grain in the foreign market, the price of wheat at point of origin and at destination. The foreign shipowner negotiates with the shipper and exacts the best rate he can get depending on conditions at the time the charter is made. In

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addition to this, the foreign owner is willing to make concessions which have become established customs in the trade. He is willing to pay the broker his usual commission. Then he allows the charterer an "address" commission of 2½ per cent. He is willing to truck the wheat from warehouse to ship's sling and he is also willing to pay dispatch money.

On the other hand, the shipping board sets its grain rate and adheres to it although foreign ships may be accepting far less. The concessions made by foreign owners are not granted by the shipping board and the latter demands that cargo be delivered at ship's sling.

Today, the grain rate is about 60 shillings for one port of discharge in Great Britain or northern Europe and an additional 1 shilling 3 pence for two ports of discharge. The shipping board's rate is 65 shillings and 67 shillings 6 pence respectively. Considering the concessions allowed by foreign owners, the rate would have to be nearly 70 shillings before American ships at present shipping board rates would find themselves on a level with foreign vessels.

Because of these conditions, it is no wonder that exporters are doing business with foreign owners while shipping board vessels swing idly at anchor. The three American vessels fixed for the grain trade since July 1 were taken at shipping board rates simply because the shippers found themselves forced to make immediate shipment and consequently they were compelled to take American tonnage for spot loading.

The shipping board's position is that it can not accept less than the rate it has fixed without losing money. But foreign ships are doing it at much lower figures and coming out in ballast to the west coast to get the business. Under these conditions, the largest surplus of foodstuffs in the history of the Pacific northwest is proving a bonanza for foreign carriers while Uncle Sam's fleet of modern freighters is rusting in Pacific harbors waiting for an improved freight market.

In this connection, it is noteworthy that much wheat is being shipped to Japan and Japanese tonnage is getting the benefit. As a rule, the Japanese purchaser buys f.a.s. which gives him the privilege of booking his own space. Consequently, the Japanese gives his business to vessels of his own country. Whether the Japanese is actuated by patriotism or gets special concessions from the Japanese owner is an unanswered question in the Occidental mind but nevertheless the Japanese ships are getting the business. This naturally brings up the question why American importers do not adopt the same tactics. If a concerted movement along this line were started, American ships would return from foreign voyages with their holds filled with freight instead of ballast.

The shipping board's new policy is to save money and to this end shipping board operators have been instructed to book no more cargo for the Orient until schedules are readjusted, the operating fleet has been reduced and a definite policy outlined. While shipping men on the Pacific favor the reduction of expense and the increase of efficiency on the part of the American merchant marine, they are a unit in declaring that Americans on the sea must meet foreign competitors on equal terms if the merchant marine of the United States is to be rehabilitated and the flag is to be seen in every foreign port. Curtailment of shipping board service means increased freights to foreign fleets paid by the American people. Consequently it means, in a word, robbing Peter to pay Paul.

Lasker Deserves Praise for Work

CHAIRMAN Lasker keeps moving. Lip service to private ownership has been a common thing for new shipping board leaders. Real service toward the same goal has been more rare. Yet here is a chairman who has been in the saddle for three or four months and continues along the route he originally set.

His cleanup of the United States Mail Steamship situation is one bit of evidence of his intentions. For some time, the whole case was beclouded by lack of knowledge and despite some newspaper criticism, the disclosure of the whole mess has satisfied the country that Lasker was right. The big ex-enemy liners are better off in the custody of a federal marshal than operating at an unreasonable loss and expense but should be sold.

In the same way, myopic congressmen who protest because someone from their own little neighborhood lost a shipping board job will get no support from any American taxpayer. Mr. Lasker orders 622 unnecessary clerks and minor officials dismissed and some senators and congressmen protest. Probably the same men have plugged the mails with franked speeches bewailing the criminal losses of the shipping experiment.

But publicly watching the treasury and privately trying to hold places on the payroll for a voter from the hometown district don't mix. And the country is in no mood to allow Mr. Lasker to be interfered with in his plans for introducing economy and saving money.

Shy Away from Bareboat Charter

THE bareboat charter plan is like the grass on the other side of the fence. It looks greener than your own pasture until you climb over the barrier. With the new shipping board openly working toward the bareboat charter plan, many of the one-time friends of the plan, are backing water.

The present cost plus arrangement is costing millions each month and is putting inefficiency on a pedestal. It must be thrown out. The bareboat plan would chop the government's operating expenses to little or nothing and would compel real efficiency to avoid commercial death. It must be adopted as a temporary step.

Stagnation in shipping, meager chances for making running expenses and tardiness in correcting the fundamental defects of American navigation laws are the chief rebuttal arguments raised by many practical men who see the insane folly of the present plan but shy at the surgical operation which the bareboat charter plan brings.

As a result, they have brought out the compromise of bareboat allocation. This would relieve operators of charter and insurance costs, but hold them responsible for maintenance. Fifty operators with 10 boats each could absorb 500 ships, keep them in service and in repair. Maximum shore overhead expenses would be set. Gross profits, if any, would be divided, the government taking the lion's share and setting aside a portion of such sums as payments toward the purchase of the vessels. The important thing is that the government must keep out of the operating field.

The plan has its appeal, but dieting never matched the knife in removing a cancer. And the shipping situation, as it has been mishandled, is a cancerous growth poisoning the government in its treatment of every other federal activity. Taxes prove it.

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Launch Big Battleship at Camden

U. S. S. Washington Is Huge, Electrically Propelled Man-of-War Carrying Eight 16-Inch Rifles

THE U. S. S. WASHINGTON, launched Sept. 1, at the Camden, N. J., yard of the New York Shipbuilding Corp., is a sister ship of the COLORADO launched from an adjacent way at the yard last March. Although authorized in 1916 and contracted for in January, 1917, construction of these two superdreadnaughts of the most powerful type afloat, was not begun until the spring of 1919 as the navy department purposely deferred its capital ship program during the war so that all available shipbuilding capacity could be concentrated on the construction of troop and supply ships and torpedo boat destroyers to meet the immediate emergency.

The main dimensions of the vessel are as follows:

Length, on water line, feet, inches 600-0.
Length overall, feet, inches 624-6.
Breadth, extreme, feet, inches 97-5¾.
Depth, to main deck, feet, inches 47-2.
Draft, normal, feet, inches 30-6.
Displacement, normal load, tons 32,600.
Displacement, full load, tons 33,600.

Like all recent United States capital ships, the WASHINGTON will be electrically propelled. Her main engines will consist of two 15,000 horsepower Westinghouse turbo-electric generators, which will generate electricty to operate four 8300 horsepower Westinghouse motors, one for each propeller. The steam will be generated by eight water-tube boilers fired by oil.

Avoids Use of Long Shafts

For propelling a warship, an important advantage of the electric drive is the fact that the main turbines are not connected mechanically with the propellers and no long shafts run through the ship. In consequence, the main turbines can be located in the most convenient position with reference to the ship's military requirements, such as protected from underwater attack, ammunition storage and handling, turret construction, and so on. An electrically driven battleship can, therefore, be made more efficient as a fighting machine than can one driven by any of the older methods, and the United States navy is far in advance of other nations in the development of this type of propulsion.

Electric drive also provides great maneuvering power, because the propellers can be almost instantly reversed with full power. In addition, the turbines operate under the best possible conditions for high economy, which means that the ship possesses a greater radius of action than one with a less economical form of drive. In the recent trials of the U. S. S. TENNESSEE, which is also equipped with the Westinghouse electric propulsion, and is a sister ship of the WASHINGTON, it was found that this great vessel could be brought to rest from full speed within three minutes, turned on a circle like a destroyer and driven backward at 15 knots, all of which are believed to be records.

The main battery of the WASHINGTON will consist of eight 16-inch, 45 caliber breech-loading rifles, mounted in four turrets two forward and two aft. Each of these monster rifles, of which there will be two in each turret, will be over 60 feet in length.

Fourteen Guns In Secondary Battery

The secondary battery will consist of fourteen 5-inch rapid fire guns placed in advantageous positions. For protection against hostile gun fire from enemy ships all vital parts of the vessel will be adequately protected by heavy armor. This will be arranged in accordance with the best American practice.

All four turrets in which the main battery is mounted, as well as the barbettes, which contain the intricate mechanism for turning the turrets and their guns in any desired direction, are entirely encased in heavy steel armor.

Probably almost as important as the armor itself, from the standpoint of protection against gun fire and torpedo attack, is the watertight subdivision of the huge fighting craft. The portion of the vessel above the splinter deck, which is practically at the load water line, is well subdivided by watertight bulkheads, but below this deck the vessel is divided honeycomb-like into a multitude of comparatively small watertight compartments. This is accomplished by closely spaced transverse bulkheads throughout the length of the ship and several watertight longitudinal bulkheads.

Each of the eight water tube boilers is in a separate watertight compartment, as is also each of the two turbo-generators which generate the electrical energy for the operation of the main propelling motors. The four main propelling motors are located in three watertight compartments. With this subdivision, even if torpedo damage should penetrate into the portion of the vessel occupied by the propelling machinery, the vessel would not be put out of commission, since the simultaneous flooding of one or more of the boiler compartments, one turbo-generator compartment, and one or more propelling motor compartments would neither sink the vessel nor render it unnavigable.

To operate this well nigh impregnable floating fortress, a complement of 45 commissioned officers, 12 warrant officers and 1022 enlisted men, including 71 marines, will be carried. Accommodations for commissioned and warrant officers will be located aft on the second and third decks. The crew's quarters will be forward and amidships on the main deck and second decks.

In general appearence the WASHINGTON will resemble the other capital ships recently added to the navy. Forward her shell will have a very pronounced flare outward from the water line to the upper deck. This flare, carried undiminished forward, naturally results in the vessel's clipper stem, intended to facilitate the stowing and handling of her anchors, of which there will be three. The clipper stem is practically the exact opposite of the ram type of bow in almost universal use on battleships a generation ago. The pronounced flare also makes possible a roomy deck in spite of the very fine water line forward. The upper deck is the weather deck from the stem to abaft midships. Here the main deck, next below the upper deck, becomes the weather deck and extends as such to the stern. The stern is of the cruiser type, now common to most large war vessels.

Also Was Last Word

The launching of the battleship WASHINGTON comes just 15 years after the delivery by the New York Shipbuilding Corp. of the armored cruiser WASHINGTON, since renamed the SEATTLE. At the time of her delivery in 1906, the old WASHINGTON was the last word in naval construction and her size and armament form an interesting comparison with present day developments. The cruiser is:

Length, on load water line, feet, inches 502-0.
Length, overall, feet, inches 504-5½.
Breadth, feet, inches 72-10½.
Depth, feet, inches 42-2¼.
Draft, normal, feet, inches 25-0.
Displacement, normal load, tons 14,500.
Fuel, coal.

The battery of this vessel consists of four 10-inch 45 caliber breech-loading rifles, sixteen 6-inch, 50-caliber, rapid-

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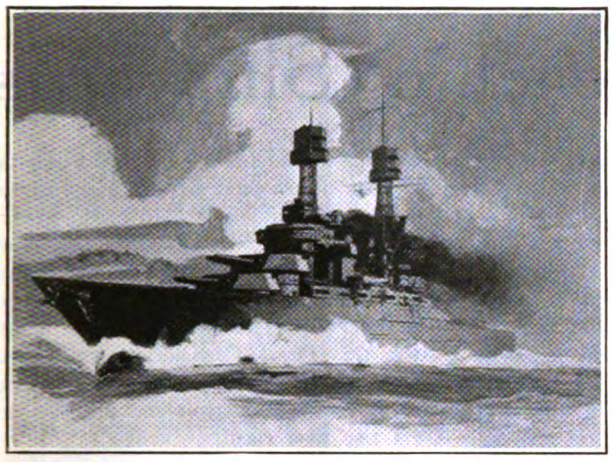
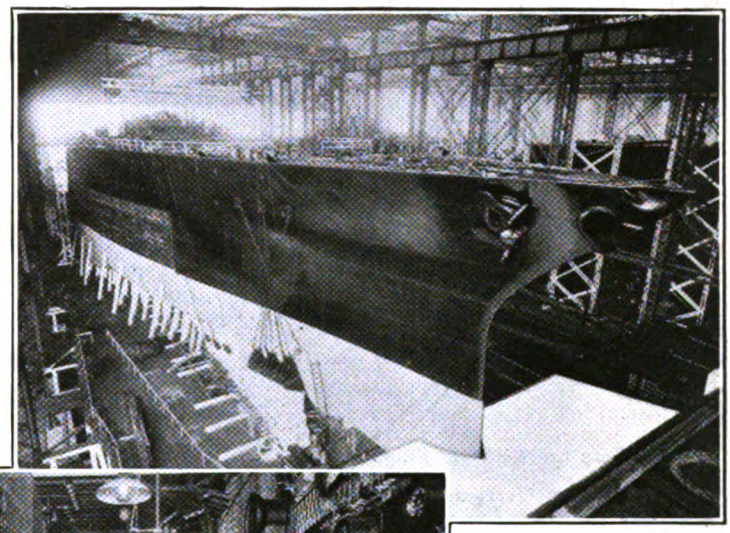
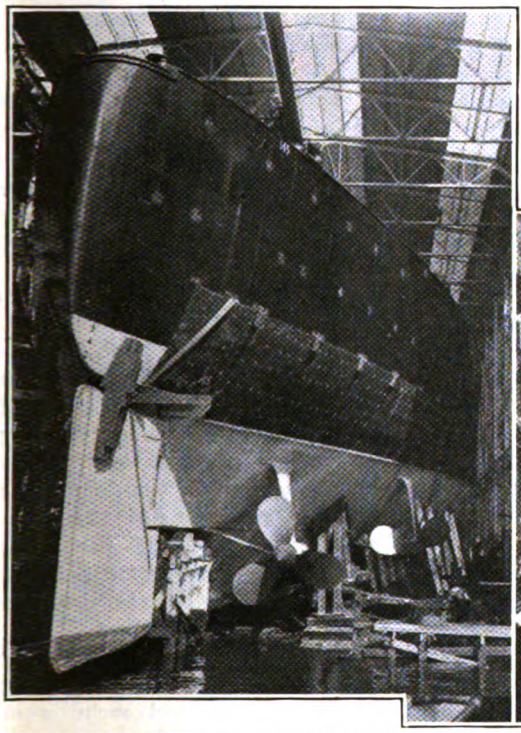
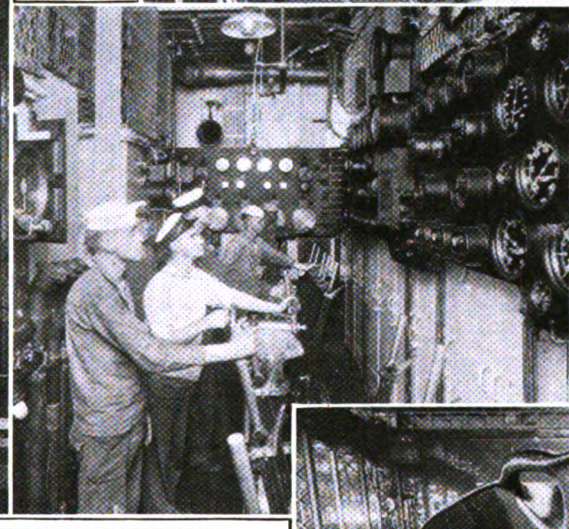
Launch Uncle Sam's New Fighter



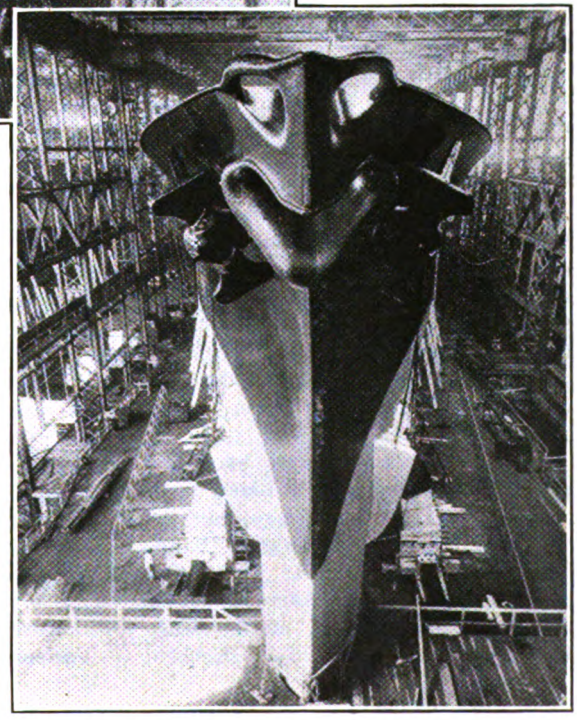
The huge superdreadnaught Washington has just been launched by the New York Shipbuilding Corp. at its Camden, N. J. yard. The views show an artist's conception of the fighter when completed, stem and stern views on the ways and the gargoyle-like bow

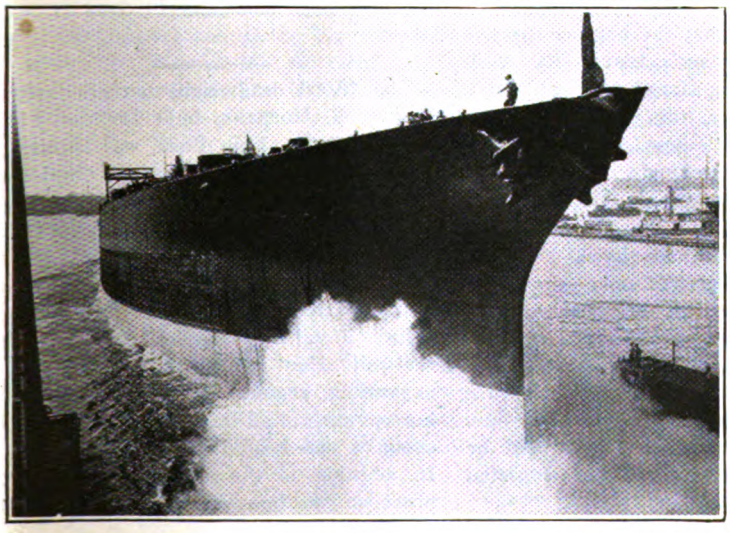






The great battleship will be electrically driven. At the left is shown the control room of her sistership Tennessee. The Westinghouse Electric & Mfg Co. supplied the electrical equipment





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fire guns, and twenty-two 3-inch, 50-caliber, rapid-fire guns.

Between the delivery of the first WASHINGTON and the launching of the battleship of this name, the New York Shipbuilding Corp. has built for the United States navy 7 battleships, 40 torpedo boat destroyers and one destroyer tender, and now has under construction the battleships COLORADO and WASHINGTON and the battle cruiser SARATOGA.

Few Contracts Now Reaching Shipyards

SHIPBUILDING in the east has been marking time. With little more than 700,000 tons of shipbuilding under contract, the yards of the United States are facing the necessity of waiting patiently until conditions alter. This situation is intensified by the revision of the policies of the shipping board. Chairman Lasker has indicated that he is through with the old system of allocation and some new form of contract with the private operators must be worked out whereby the costs of operation are shifted from the government. This means an intensive campaign to sell the government's fleet and failing in that to charter the boats to the operators upon a bareboat plan.

Offers to Sell 12 Ships

The Anderson Overseas Corp., acting as agent for the board, had entered negotiations to sell 12 ships to foreign buyers. These included ships of the submarine boat and lake type, but the fall in exchange rates made it impossible to expect the deals to go through. Therefore, the board canceled its agency agreement with the Anderson corporation and will attempt to dispose of the ships first in the American market.

An effort was made to sell the total wooden fleet and 12 of the ex-German ships were offered for sale during August. The bids on the latter were rejected because the board decided that it must obtain cash for the ships. They will be reoffered with a minimum price set. Furthermore the passenger ships which were under charter to the old United States Mail line will be offered for sale and there is hope that an actual sale may be accomplished. In the meantime the reconditioning of the shipping board's vessels has been held up. Owing to this revision of policy on the part of the board, repair work has been rather scarce in the eastern district and reports indicate a still futher decline in immediate prospects.

Some contracts, however, have been awarded. The Governor's Island ferryboat GENERAL OTIS will be reconditioned by the Tebo Yacht Basin Co., Brooklyn, at a cost of $15,750. The United American line steamer SUFFOLK will be overhauled at the plant of the Morse Dry Dock & Repair Co., Brooklyn, which was awarded the work on a low bid of $20,500. The Sun Shipbuilding Co., Chester, Pa., made the low bid on reconditioning the shipping board's London liner PANHANDLE STATE, which work contemplated the installation of steerage quarters. The bid was $139,554, but the shipping board has decided to suspend the prosposed work and the ship has been scheduled for transatlantic service during September.

The Norwegian American line is now considering bids offered by American yards to convert the passenger ship STAVANGERFJORD to an oil burner. This line had the BERGENSFJORD converted to an oil-burner in the United States some time ago. American yards are bidding on the new work in competition with British, German and Scandinavian yards.

The army transport service has decided to have repairs made to the transport MADAWASKA at the Shooters Island, N. Y., yard of the Standard Shipbuilding Corp. The work will include the installation of three double-ended and one single-ended Scotch boilers, new tank tops and considerable refrigeration space. The United American lines will have the collier FRANKLIN overhauled.

The United States engineer office has let a contract with the Dravo Contracting Co., Pittsburgh, for a drill boat. The boat will be 140 feet in length, equipped with two water tube boilers fitted with the oil burning system. She will have ten rock drill engines and four cargo winches. The cost will be $431,500.

Low Bids on Liners

It is reported that the bids on the two Red D line passenger boats, 4300 deadweight tons each, ranged from $1,100,000 to $1,800,000 per ship. The line has been considering these bids for some time and it is expected that a contract will be made before long. Naval architects considered the bids very low and expressed the conviction that the yards were willing to take the work at approximately cost in order to keep their organizations together. The Merchant Shipbuilding Corp., Chester, Pa., has been awarded the contract for the second police boat purchased by the city of Philadelphia. The cost will be $212,490, and the boat will be completed within seven months.

Various reports have been current regarding the intention of Henry Ford, the Detroit automobile manufacturer, entering the shipbuilding field to produce fabricated boats. It was reputed that Ford wishes to purchase the Victory plant in Squantum, Mass., for his experiment. Another report current during the month was that Ford is considering the operation of a fleet of self-propelled freight barges between Detroit and the seaboard via the Erie canal.

The principal shipbuilding companies on the Atlantic and Gulf coasts employ approximately 40,000 less shipyard workmen than they did a year ago. The reduction in employment has been estimated to have been approximately 45 per cent during the year. The slump has, naturally, enabled the yards to dispose of the services of much inefficient labor.

Another Wage Cut is Made

At the Harlan plant of the Bethlehem Shipbuilding Corp., Wilmington, Del., another wage reduction of 10 per cent was put into effect on Aug. 15. This is the second reduction this year and the two bring the basic wage from 84 to 64 cents an hour. It was the intention of the yard, after this second reduction, to put all their employes, numbering 500, back on full time work. New York plants announced a reduction of about 13 per cent in the wages of ship painters to go into effect Sept. 1. The wage has been 70 cents an hour for ship bottom painting and 80 cents for interior painting and yacht work. the new scale is 60 and 70 cents respectively.

The 10,000 deadweight ton oil tanker ROBERT G. HOPKINS, built for the Tide Water Oil Co., New York, was launched recently at the Chester yard of the Merchant Shipbuilding Corp., Chester, Pa. The tanker measures 440 feet over all, has a 58-foot beam and a molded depth of 33 feet. She is capable of carrying 70,000 barrels of cargo oil in her 18 main oil tankers besides 9550 barrels fuel oil. Her propulsion is five triple expansion engines with an indicated horsepower of 2700, and designed to obtain a speed of 10½ knots per hour. In addition to the 18 large oil tanks, provision has been made for 60,000 feet of packet freight.

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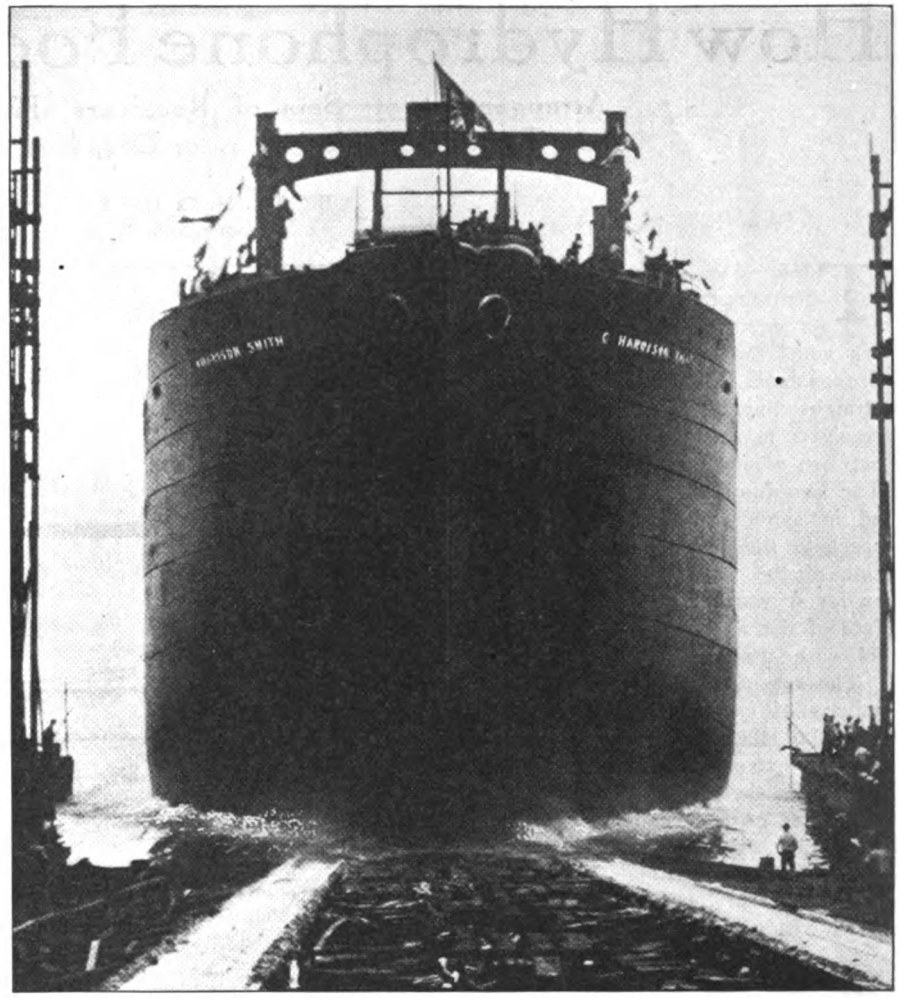
Large Oil and Ore Ship Ready for Delivery

The first of the combination ore and oil vessels building at the Sparrow's Point, Md., plant of the Bethlehem Shipbuilding Corp. was scheduled for delivery about the middle of September. This vessel, the G. HARRISON SMITH, is being built for the International Petroleum Co. and is one of four ships of this type under construction at Sparrow's Point.

The G. HARRISON SMITH is distinctive in that she is the largest vessel ever constructed at this plant, having a deadweight capacity of 20,000 tons and a length overall of 571 feet, 6 inches. She is designed for carrying a full cargo of either ore or oil in separate compartments. The ore cargo will be carried in a narrow elevated hold 30 feet wide and 360 feet long. It is divided by watertight bulkheads into three compartments, each of which is served by three large hatches extending the full width of the ore hold.

The oil space, alongside and below the ore space, is divided by a longitudinal bulkhead extending from the keel to the ore hold. The foremost and aftermost compartments are for fuel oil and the tanks between these are for cargo oil.

The wing spaces, acting as expansion trunks, on account of their depth afford the greatest possible flexibility for carrying liquid cargoes of varying density and adjusting the trim under all conditions of load.



LAUNCHING 20,000-TON OIL AND ORE CARRIER G. HARRISON SMITH AT SPARROWS POINT

Wins Big Repair Job on $149,600 Bid

MEETING competition from every other large yard on the Pacific coast, Todd Dry Docks, Inc., Seattle, was awarded the contract for making alterations and improvements on the shipping board liner WENATCHEE on a bid of $149,600. The Todd bid included insurance on the big liner and when the WENATCHEE is turned back to the government she is to be in first class shape. The big repair job followed the liner's disappointing performance on her maiden voyage to the Orient which developed serious defects which will now be remedied. Rapid progress is being made at the Todd plant but the WENATCHEE will not go out on her next voyage until late in the fall. Bids ranged on this job from the low figure of Todd Dry Docks, Inc., to $177,520 by a San Francisco yard, the latter figure including the costs of towing to San Francisco and redelivery.

Todd Dry Docks, Inc., are also completing a job on the coaster REDONDO, for which a new rudder and stern frame were made, the work entailing a cost of approximately $15,000. The same yard also installed a new lower section in the stern frame of the shipping board freighter ELDRIDGE, and has also had considerable repair docking work on other vessels.

Six bids were submitted for repairing the shipping board steamer EFFINGHAM, which was damaged by stranding in the Columbia river. The job went to the Albina Engine & Machine Works, Portland, Oreg., on a low bid of $25,132 in 25 days' time.

The Union Iron Works, San Francisco, was awarded the contract for repairing the Pacific Mail liner GOLDEN STATE at a cost of $91,600.

Issuance of a $1,000,000 trust deed with which to meet incurred obligations of the Norway Pacific Dry Dock & Construction Co., Everett, Wash., is the most recent development in the affairs of this company, which established a shipyard but has never begun construction. This bond issue is the result of an agreement reached at a meeting of creditors. The future of the plant is uncertain, but according to Receiver M. E. Barham, who is still in New York conducting negotiations, it is expected that plans will shortly be completed for financing the undertaking and bringing to Everett a new industry.

At the Wallace Shipyards, Vancouver, B. C., the Canadian Pacific's new coastwise steamer PRINCESS LOUISE was successfully launched on Aug. 29. The following day the Canadian government's freighter CANADIAN TRANSPORTER was launched at the Coughlin yards, Vancouver.

The CANADIAN SCOTTISH, first of two steel freighters built at Prince Rupert, B. C., has been delivered to the Canadian government. A sister vessel, CANADIAN ENGLISH, will be completed late in September, finishing the government program at this yard. Obstruction of these vessels was long delayed by financial complications.

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How Hydrophone Focuses Sound

Arrangement of Sets of Receivers Finds Direction and Excludes Noises Operator Does Not Want To Hear

BY DR. H. C. HAYES
Sound Aide, U. S. N.

THE MV hydrophone is a submarine sound detector employing a multiplicity of sound receivers which are divided into two equal groups and spaced equally along a straight line. Usually there are 12 receivers in each line and the spacing between adjacent receivers is 12 inches. The two lines of receivers are mounted in symmetrical positions with respect to the ship's keel, one on each side of the vessel. They are located as far forward, as far below the surface of the water, and as nearly parallel with the keel as possible.

The spacing between the several receivers of each line is maintained by attaching them to a messenger cable and an extension of this cable serves to draw the line of receivers into a tube made of wood or some other material that readily transmits sound. The two tubes for holding the two lines of receivers are mounted in fixed positions within the forward peak-tank or one of the tanks included between the double bottom of the vessel, or they may be mounted on the outside of the ship's skin and covered by a streamlined protective blister made of metal and attached to the ship's skin.

Must Exclude Gases

So far as the transmission of sound is concerned, most solids and liquids behave somewhat alike, and, as a result, if a liquid is enclosed in a solid or a solid is immersed in a liquid, sound passes quite readily from one medium to the other. In the case of gases, the physical characteristics are so different from those of liquids and solids that sound does not readily pass from a gaseous medium to either a liquid or a solid medium nor from a liquid or solid medium to a gaseous medium. As a result, it is necessary that the receiver tubes should be filled with a liquid and that the tubes themselves be surrounded by a liquid in such a way that the submarine sounds which it is desired to hear can penetrate to the receivers without passing through air. This is accomplished by mounting the tubes in the peak-tank or a double bottom tank that is kept filled with liquid, or by mounting them on the outside of the vessel beneath blisters which are filled up with some liquid.

Describes Instrument

AS THE second in a series of three articles dealing with the safeguarding of navigation by sound this describes the hydrophone developed for this purpose during the world war. The first of the series which appeared in MARINE REVIEW *for September, explained the theory of the instrument. The third and concluding article, yet to be published, will illustrate how the hydrophone in a practical way may be used to aid and safeguard navigation.*

The receiver consists of a small water-tight cylindrical chamber, one end of which carries a diaphragm, to the inside center of which is attached a carbon granule microphone. The other end of the chamber carries a stuffing-box, through which the two electrical leads to the microphone pass.

The electrical leads from all the receivers are extended to the listening station, usually the chart-house, by means of a multiple-conductor cable. The leads from this terminal of the cable attach to the electrical compensator, where, by means of a multiple-pole, double-throw switch, the receivers of either of the two lines can be connected in circuit with the compensator proper.

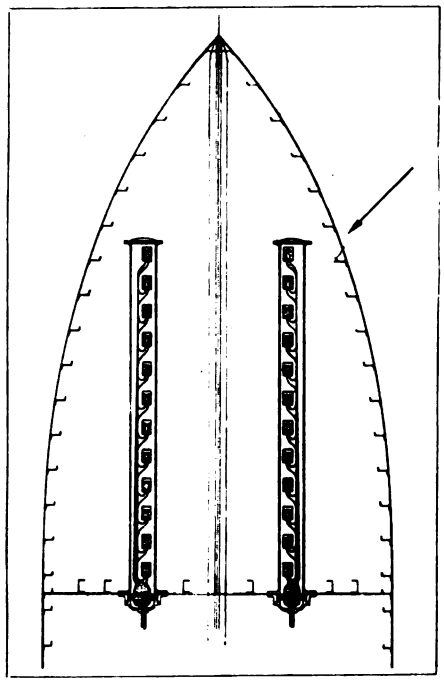

FIG. 1—SECTION OF BOW TANK SHOWING RELATIVE LOCATION OF PORT AND STARBOARD RECEIVER LINES AND INTERVENING SOUND SCREENS

The compensator consists essentially of a number of so-called electrical retardation lines and an ingenious switching device whereby more or less electrical retardation can be imposed upon each of the receiver circuits. The outlet from the compensator consists of two telephone circuits, one of which traverses a telephone receiver for the right ear and the other a like receiver for the left ear. The two receivers are attached to an ordinary head receiver support, but, unlike most telephone head sets, each receiver is actuated by a separate and distinct circuit.

The Principles in Operation

Operating principles of the MV hydrophone may be understood in connection with Figs. 1 and 2. The peak-tank of a vessel is represented in Fig. 1 with the two lines of receivers mounted in their respective retaining tubes. Midway between the two lines is a sound screen, which serves to shield the port receivers from sounds off starboard and the starboard receivers from sounds off port. Such a screen is not necessary if the two lines of receivers are enclosed in blisters as the hollow hull of vessel serves as an intervening screen. The sound screen used with tank installations consists of thin felt or asbestos covered watertight with thin sheet metal. The air enclosed within the felt or asbestos filter prevents the sounds from passing through. A schematic diagram of the electrical compensator is shown in Fig. 2 which illustrates the principle upon which this device operates.

Suppose a sound approaches the vessel from off the starboard bow, having the direction indicated by the arrow shown in Fig. 1. The operator determines at once whether such a sound is off the port or starboard side of the vessel by connecting first one and then the other line of receivers to the compensator by means of the mul-

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tiple-pole, double-throw switch. The sound will be off the side of the vessel carrying the line of receivers giving the loudest response. A sound proceeding from the direction indicated in Fig. 1 would give a loud response on the starboard receivers, but, due to the shielding effect of the sound screen, it would appear very weak on the port line of receivers.

Gives More Information

In thus determining whether a sound source is located off the port or starboard side of a vessel, the MV hydrophone furnishes the navigator with all the information which the present types of sound apparatus installed on vessels for navigational purposes can furnish. Moreover, because of its ability to bring into focus the sound which it is desired to hear and at the same time weaken the local disturbing sounds, it is able to detect sounds too faint to be heard on other types of receivers and in general, to hear all sounds at a greater range.

But the information furnished by the MV hydrophone is not limited to telling on which side of a vessel a sound source is located. It readily determines, with considerable accuracy, the actual bearing of the sound source. The method of doing this may be understood by considering Fig. 2.

This figure represents a line of receivers and their respective circuits through the compensator. All 12 receivers, numbered 1 to 12 inclusive, are connected in parallel with battery *B*. The battery circuit can be opened or closed by means of switch, *S*. Each receiver circuit contains the primary coil of a small transformer. The 12 transformers are identical and are used to prevent the direct current furnished by the battery from passing through the telephone receivers. One terminal of the secondary coil of each transformer is connected to a common lead from the two telephone receivers. An electrical retardation line, represented schematically by an extended coil, attaches to the other terminal of the secondary coil of each of the 12 transformers. The point of current take-off from each of the retardation lines can be varied by means of a movable contact point represented on each of the lines by an arrow-head. The current induced in the secondary coils of the transformers connected with the first six receivers meet at a common junction, *l*, and from there pass through the receiver, *L*. In a like manner, the currents induced in the secondary coils of the other six transformers unite at the common junction, *r*, and from there pass through the receiver, *R*.

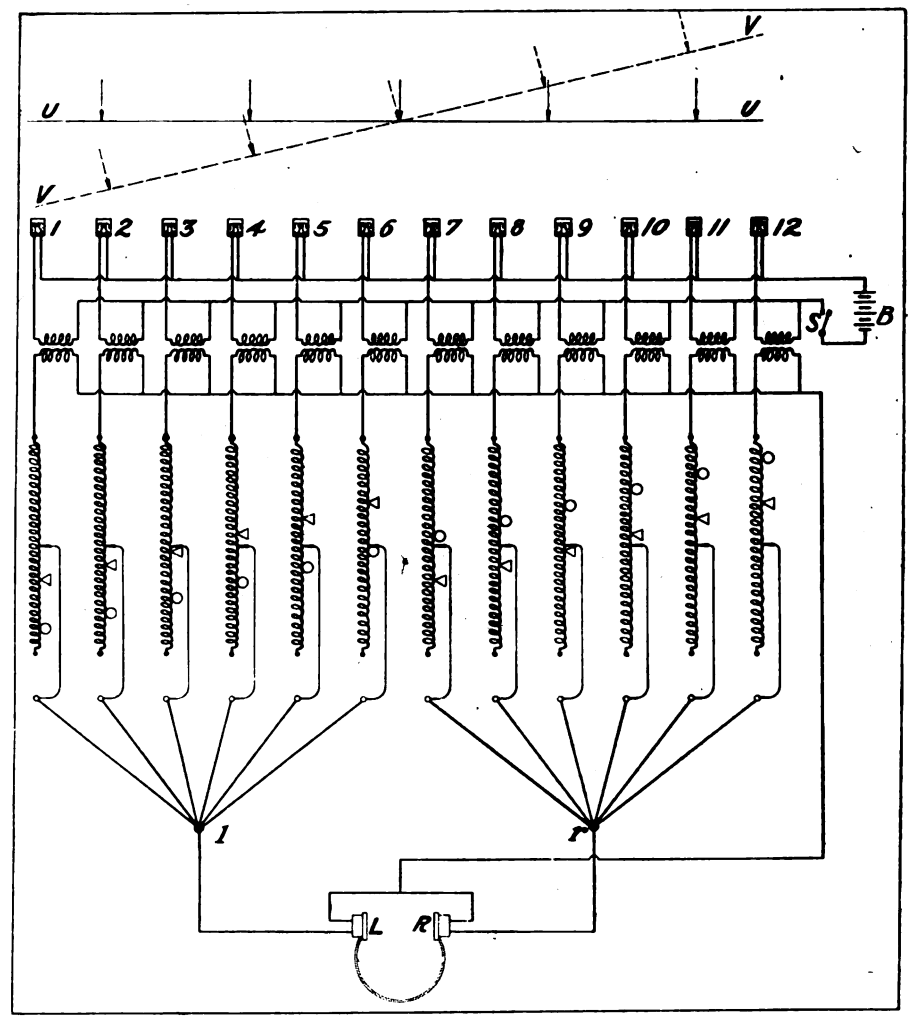

FIG. 2—SCHEMATIC WIRING DIAGRAM OF AN ELECTRICAL M-V COMPENSATOR CONNECTED TO A LINE OF RECEIVERS

Consider a sound from a distant source to be approaching from a direction perpendicular to the line of receivers. Its wave front will then be parallel with the line or receivers, as represented by the full line, *U-U*, and its direction will be represented by the five arrows abutting on this line. It is evident that the electrical impulses which the sound waves set up in each of the 12 receivers will be alike, providing the receivers are all alike, and that corresponding variations in the current from each of the receivers will take place simultaneously.

Will Not Be Simultaneous

It also is evident that if the sound approaches from any other direction, such that its wave front, as represented by the broken line, *V-V*, is not parallel to the line of receivers, then the current impulses which the sound waves set up in the several receivers will be identical, but corresponding variations of the current in the several circuits will not take place simultaneously, or, in other words, the current in the several circuits will not be in phase.

For the wave having front *V-V*, the phase of the current impulses in the circuit of receiver (1) are in advance of those in the circuit of receiver (2), and those in the circuit of receiver (2) are in advance of those in the circuit of receiver (3) by the same amount and so on progressively for the various receivers, until for receiver (12) the current impulses of its circuit lag behind those of the circuit of receiver (1) by an amount that is eleven times that between the impulses in circuits (1) and (2). Finally, it is to be noticed that the actual value of the phase difference between any or all of the currents of the several circuits depends upon the direction of the sound, or its wave front, with respect to the line of receivers.

The phase relations between the current in the several secondary circuits can be varied at will by introducing more or less of the retardation lines into the several circuits by means of

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the variable contact points represented by the arrow heads of the 12 conductors converging at *l* and *r*.

Consider a sound having its wave front parallel to the line of receivers. This wave will strike the several receivers simultaneously and, as a result, the current in all 12 primary circuits will be in phase. The current in all the secondary circuits will also be in phase, providing the variable contact points are set so that there is the same retardation in each circuit. Under such conditions, the current of the secondary circuits of receivers (1) to (6), inclusive, which meet at the common junction *l*, will add together to give, through telephone *L*, a current six times as strong as the current from one receiver. Also, in a like manner, the current from receivers (7) to (12), inclusive, will add at *r* and give a current through telephone *R* six times as strong as that from a single receiver. This results in making the response of the telephones to the sound in question six times as intense as it would be if only one receiver were connected to each ear. Moreover, it is to be noticed that corresponding impulses will reach the two telephones simultaneously so that the sound will appear to the listener to be binaurally centered. Consider, now another sound source, so located that its wave front is not parallel with the line of receivers. Let its wave front be represented by the broken line *V-V* and assume the take-off point from each of the retardation lines to be such that the currents produced in the several circuits by the wave front *U-U* will arrive at the two telephones in phase. It is evident that the current in the several circuits produced by this sound will not be in phase. As a result, the current in each of the first six circuits will not arrive at *l* in phase and therefore will not add perfectly. The resultant current through telephone, *L*, will be less than it would be if the wave front were parallel with the line of receivers. Similarly, the currents of the six circuits joining at *r* will not be in phase and the resulting current through the telephone *R*, will, like that through *L*, be less than it would be if the wave front were parallel with the line of receivers. Finally, it is to be noted that the phase of the resultant current through *R* will lag behind that of the resulting current through *L*, and therefore the sound will not be binaurally centered but will seem to be located to the listener's left.

Now suppose two sounds strike the receivers simultaneously, one having the wave front, *U-U*, and the other the wave front, *V-V*. If the compensator adjustment still remains the same, the listener will hear the sound having wave front *U-U* very loudly and clearly and it will be binaurally centered. He will also hear the other sound faintly off toward his left. Moreover, if several other sounds strike the receivers at the same time from other directions, he will probably hear them all faintly, each appearing to be located to the listener's right or left, depending upon the direction of the sound. Sound from one direction, namely, perpendicular to the line of receivers, will be loud and clear-cut and this sound will be binaurally centered. The presence of other sounds, and among them the local disturbing noises caused by propellers, auxiliaries, slapping of waves, etc., will not prevent the listener from hearing this one sound because they are relatively weak and not binaurally centered.

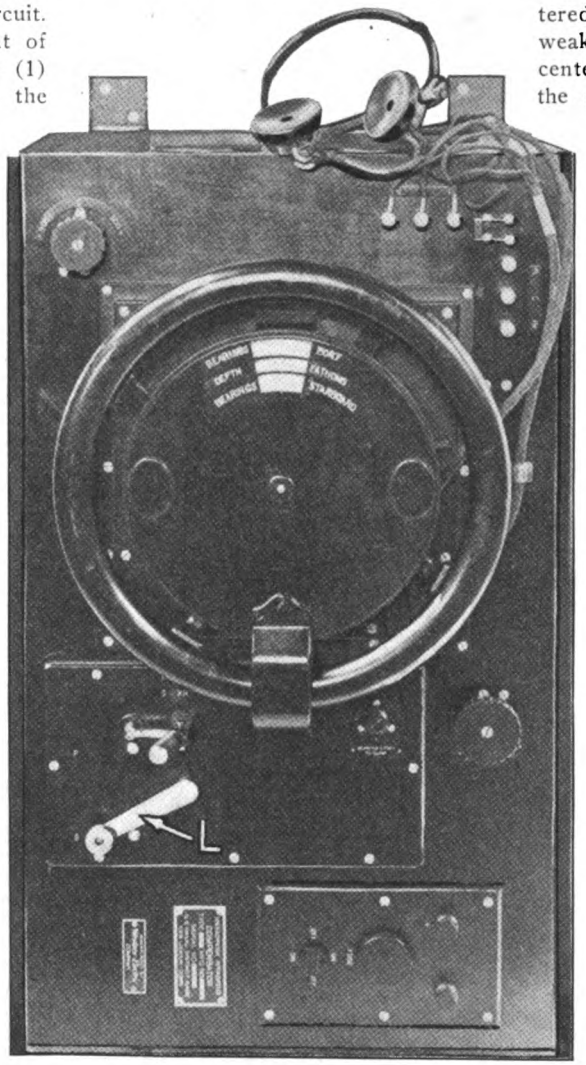

FIG. 3—FRONT VIEW OF THE ELECTRICAL M-V COMPENSATOR

A sound is said to be in focus when the adjustment of the compensator is such that the currents of the several circuits arrive at *L* and *R* in phase, and out of focus when these currents arrive at *L* and *R* out of phase. When a sound is in focus, it is intense, clear-cut, and binaurally centered, and when out of focus, it is weaker, blurred, and not binaurally centered. Under the conditions cited, the sound having wave front *U-U* is in focus and that having wave front *V-V* is out of focus. It remains now to show that sound from any direction, such as that having wave front *V-V*, can be brought into focus. The currents of the six circuits joining at *l* and produced by the wave front *V-V* can be made to reach *l* in phase by properly adjusting the position of the six contact points on the retardation lines, and a similar adjustment of the retardation lines of the other six circuits will cause their currents to reach *r* in phase. Such an adjustment would consist of shifting the several contact points to positions along the retardation lines similar to those represented by the small triangles. Although this adjustment of the contact points brings the currents from the first six receivers into phase at *l* and those from the other six receivers into phase at *r*, the two resultant currents will not reach their respective telephone receivers, *L* and *R* in phase. The phase of the *L* current will be in advance of that of the *R* current and the sound will not be binaurally centered. If, however, the triangles are all moved an equal proper distance along the retardation lines to a position similar to that shown by the circles, then the *L* and *R* currents can be brought into phase and the sound will be binaurally centered. Under such conditions, the sound having wave front *V-V* will be in focus and all other sounds, and among them *U-U*, will be out of focus.

In order to bring any sound, such as *V-V*, into focus, the actual position of the various circles along the several retardation lines depends, of course, on the angle which the sound makes with the line of receivers. The important point to notice is that for every direction of the sound with

(*Concluded on page* 473)

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Activities in the Marine Field

Latest News From Ships and Shipyards

Lake Vessels Lose in Handling Grain

BY MYERS L. FEISER

SHIPPING on the Great Lakes has shown but little more activity in the past month, ore and coal continuing at about the rate prevailing throughout the summer while grain showed some liveliness with the arrival of the harvest season. This was expected, however, and operators were prepared.

The cheerfulness which otherwise might have characterized the grain operations was more or less dampened, however, by delays occasioned in the unloading of cargoes at Canadian ports. Several steamers showed losses in the handling of their grain cargoes and refused to carry further business in this traffic without some reparation. This was granted in several cases, shippers agreeing to pay demurrage charges in the event delays went beyond a certain point.

Freight in other lines has been quiet, contract tonnage moving most of the available business. This was particularly true of ore and coal which continued through the season in a dull and inactive way.

* * *

The E. L. BOOTH of the Boland & Cornelius fleet, Buffalo, has had her name changed to G. M. WILSON.

* * *

Two barges recently made the trip from New York to Detroit. The barges, belonging to the People's Barge Canal line, were picked up at Buffalo by the tug Q. A. GILLMORE of the Great Lakes Towing Co.

* * *

JED, a steamer formerly the MAPLE GROVE and earlier the CHEROKEE, built in 1889 and owned by Capt. J. F. Sowards, Kingston, Ont., foundered in Lake Ontario recently and was lost. Her crew was saved. She was loaded with coal.

* * *

The COLONIAL, formerly the HURON, a steamer for passenger and general cargo, recently cleared from Cleveland for Rondeau, Ont., after having undergone extensive repairs.

* * *

The freighter T. K. MAHER, bound from Escanaba to Chicago with ore, lost her wheel 25 miles south of Sheboygan and was picked up and towed to Chicago by the steamer GRAND ISLAND.

* * *

The steamer D. G. KERR was unloaded of 12,382 tons of ore by the Pittsburgh & Conneaut Dock Co. at Conneaut Sept. 12 in three hours and five minutes. This is a new ore unloading record, bettering that made on the steamer PETER A. B. WIDENER at Conneaut several years ago. Two weeks previous to the new ore record, the KERR was loaded with 14,045 tons of coal in four hours and 25 minutes. This also was at Conneaut and was a new coal loading record. The KERR, which is of the Pittsburgh Steamship Co.'s fleet, also participated in another new feat when the ore unloaded at Conneaut Sept. 12 was loaded at Two Harbors in 16½ minutes.

* * *

The J. W. SIMPSON, formerly the MANCHESTER, recently put in at Cleveland for repairs to a broken shaft. She was towed from Buffalo by the steamer CHRISTOPHER.

* * *

Capt. John M. Lohr, Marine City, Mich., disappeared after leaving his ship, the THOMAS MAYTHAM, at Sault Ste. Marie Sept. 7 and his body was found next day in the canal.

* * *

The annual outing of Cleveland ore, coal and vesselmen was held at Avon, O., Saturday, Sept. 10. The affair was under direction of Clinton F. Taylor, 1527 Kirby building, Cleveland.

* * *

Capt. Daniel Hourigan, 80 years old, died suddenly at his home in Oswego, N. Y., Sept. 6. For 58 years he was a sailor and master of vessels on the Great Lakes, 32 of which were as master of the fleet operated by the George Hall Coal Co., Ogdensburg, N. Y. He retired four years ago when his last command, the ADRIAN ISELIN, a Hall steamer, was commandeered by the government for war purposes.

* * *

James H. Woods, manager of the lake trade of the Pittsburgh Coal Co. for a number of years, has been made manager of sales with headquarters in the Oliver building, Pittsburgh. He succeeds the late Walter A. Marsh.

* * *

The steamer NIKO loaded at Sandusky recently with wheat for Montreal, the first cargo of this grain for the Montreal district out of Sandusky in 20 years.

* * *

Capt. Charles A. Peterson, a former lake vessel master who began his career as a sailor before the mast, died recently at his home in Sandusky, aged 83 years.

* * *

The steamer SULTANA, which had gone ashore at Fox Point, recently put in at Milwaukee for repairs.

* * *

About 225 members of the Traffic club of Cleveland late in August enjoyed a trip on the C. & B. Transit Co.'s steamer, the CITY OF ERIE, to Cedar Point. Louis Schroeder of the New York Central lines was chairman of the entertainment committee.

* * *

Capt. A. J. Talbot, late in command of the Pittsburgh Steamship Co.'s steamer PERCIVAL ROBERTS JR., has been assigned to take charge of Lorain harbor. He has been connected with the Pittsburgh Steamship Co. for 26 years.

* * *

Early in September, the Strawberry island buoys 6A and 10, Niagara river, Tonawanda channel, were reported missing.

* * *

The PETER A. B. WIDENER, bound for South Chicago with ore, was shifted to Lake Erie for repairs after hitting an obstruction in the entrance to the West Neebish channel recently.

* * *

Grounding without damage, the steamer R. R. RICHARDSON was released by the tug WISCONSIN. The accident occurred near the Interstate bridge at Duluth.

* * *

Bound for Cleveland with ore, the steamer C. H. MCCULLOUGH went aground off Grand Pointe but as she was on soft bottom, she was released without damage.

* * *

President William Livingstone of the Lake Carriers association has asked all masters navigating the new downbound channel at Port Huron to check in passing the Grand Trunk Elevator Co.'s elevator as difficulty has been found in holding ships to their dock while loading or discharging cargoes at that point.

* * *

The FAYETTE BROWN, the M. A. BRADLEY and the HARVEY H. BROWN, all of the Harvey H. Brown & Co. fleet, which have been in ordinary at Buffalo since last fall, recently started up the lakes. All cleared light.

* * *

The ALEX B. UHRIG, which grounded in Lake Michigan 2 miles south of Big Point Sable light late in August, was released and proceeded on her way undamaged.

* * *

The Martins Reef light vessel, which had been withdrawn temporarily from her station in Lake Huron, has been returned, according to E. L. Woodruff, superintendent of lighthouses.

* * *

The United States lake survey reports the monthly mean stages of the Great

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Lakes for August, 1921 was as follows:

Lakes	Feet above mean sea level July	August
Superior	602.59	602.77
Michigan-Huron	580.44	580.18
St. Clair	575.37	575.29
Erie	572.90	572.49
Ontario	246.37	245.93

Lake Superior is 0.18 foot higher than last month, 0.16 foot lower than a year ago, 0.10 foot above the average stage of August of the last 10 years. Lakes Michigan and Huron are 0.26 foot lower than last month, 0.83 foot lower than a year ago, 0.75 foot below the average stage of August of the last 10 years. Lake Erie is 0.41 foot lower than last month, 0.16 foot lower than a year ago, 0.14 foot below the average stage of August of the last 10 years. Lake Ontario is 0.44 foot lower than last month, 0.31 foot higher than a year ago, 0.57 foot below the average stage of August of the last 10 years.

Along the Atlantic and Gulf Coasts

THE S-51, last of the submarines now under contract for the United States to be built at the plant of the Lake Torpedo Boat Co., Bridgeport, Conn., was launched from the ways of the company on Aug. 20. Mrs. R. P. Mills, wife of one of the officials of the torpedo boat company, was sponsor. The S-51 is 420 feet long and is a sister ship of the S-48, S-49 and S-50, which have recently been launched at the Bridgeport plant.

* * *

It is reported that the shipping board steamer LAKE FANNIN, now under repairs at East Boston, Mass., has been allocated to the Clyde line for the Boston-Charleston-Jacksonville service.

* * *

After being in the coal trade for more than two years between Hampton Roads and Boston, the two former shipping board steamers, NORTHERN WAVE and NORTHERN KING, which were sold several months ago by the shipping board, are to be converted into barges.

* * *

Another steamer, the ARABIC, will soon be added to the two already maintaining the Mediterranean-Boston service of the White Star line.

* * *

The recent plans for absorbing the Coastwise Transportation Co. by the American Hawaiian Steamship Co. have been carried out. This brings 28 vessels into the fleet of the latter company.

* * *

The 4-mast schooner, ALICE M. COLBURN, has recently been purchased by Capt. O. A. Gilbert, Boston, at a cost of approximately $50,000.

* * *

The Commercial Maritime Co., Boston, has recently been incorporated for $100,000 by Frank Dooley president, Kendrick S. Smith treasurer, and William J. Kearney.

* * *

Shipping service at Port Houston of Blakely, Smith & Co., steamship agents, will be extended to include ports of the Mediterranean, it is announced. The number of additional sailings will depend upon available port facilities, the company states. The new service was to be inaugurated with the sailing of the freighter MAR DEL NORTE. The principal cargo to be carried will be cotton, and the first sailing was to be to Barcelona, Spain.

* * * *

Outstanding among the important developments in the gulf section was the announcement the federal government is going to abandon the Jackson barracks, situated on the Mississippi river, just below New Orleans, and rumors that advances have been made by the Jahncke Dry Dock & Ship Repair Corp. to take over this site from the government. The barracks adjoins the site already in use by the Jahncke organization and its acquisition undoubtedly would mean an outlay of fresh capital in developing this extension of the present plant. The barracks ground has a frontage of 1200 feet on the river and the strip extends back several miles to Lake Ponchartrain.

* * *

Announcement by Senator Ransdell of Louisiana that he would seek to have congress appropriate an additional $2,000,000 for the extension of government work in deepening the southwest pass at the mouth of the Mississippi followed a recent trip of inspection by the senator to the mouth.

* * *

A number of contracts were let by the New Orleans dock board during August. Principal among these were the contract for the building of the Charbonnet street wharf, which is to be used in conjunction with the handling of flour exports, to the Dalgarn Construction Co. for $99,450. A contract for ratproofing the Harmony street wharf was awarded to J. Watts Kearney Sons for $3,032. Contract for seven motors for suction apparatus of the grain elevator was awarded to the Fairbanks-Morse Co. for $9196.

* * *

The New Orleans dock board has decided the rental of the Doullut & Williams shipyard must continue at the rate of $10,000 a year, although that company is not building vessels on any outside contracts now. The dock board is making an effort to lease, or purchase, from the war department one unit of the army warehouse system constructed at New Orleans during the war.

* * *

Arrangements were recently completed between the Mississippi Warrior Barge Line service and the Southern Oyster Grit Co., Biloxi, Miss., to handle from 200 to 250 tons of crushed oyster shells a week from Apalachicoal, Fla., to New Orleans.

* * *

In the hope that an advance in full cargo grain rates which would make the trade profitable is not far distant, the shipping board has diverted to New Orleans 25 large steamships which have been engaged in carrying coal from Norfolk to the United Kingdom during and following the strike of British miners.

* * *

A record was established by the port of New Orleans in July in handling ships at the wharves. Hayden Wren, superintendent of the dock board, stated that an average of 66 vessels were handled daily during the month.

* * *

Rumors have connected the name of J. Warren Kearney with the dock board. Several times it has been reported that Governor Parker was about to appoint Mr. Kearney since the resignation of Hugh McClosky was submitted several months ago.

* * * *

July was the banner month for the movement of freight on the Mississippi section of the Mississippi-Warrior Barge line. Approximately 50,000 tons of freight were handled between New Orleans and St. Louis in that month.

* * *

Barges of the Mississippi-Warrior service will be enabled to keep in constant touch with each other by wireless equipment. Three of the craft have already been fitted and the others will be equipped as rapidly as possible. Communication through the naval radio station at New Orleans will be extended through the erection of a wireless station at Memphis and possibly St. Louis.

* * *

New Orleans is to be the principal port in the operations of the Maritime Contracting Co., a mutual association composed of large shipping firms at New York, Boston, Philadelphia and Baltimore on the Atlantic coast; Chicago, St. Louis, Cincinnati and Louisville in the interior and Portland, Seattle, San Francisco and Los Angeles on the Pacific. At the head of the New Orleans office is L. E. Andrews, former division freight agent of the Ward line.

* * *

The Aluminum line, owned by the American Bauxite Co., has decided to close its New Orleans office Nov. 1. The four vessels owned by the com-

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pany have been laid up indefinitely according to announcement by I. G. Calderwood, manager of the suspended line. German competition is given as the cause for the slackening in the demand for the company's products.

* * *

N. O. Pedrick, general manager of the Mississippi Shipping Co. has been elected president of the gulf shipping conference for another year. Other officers chosen were R. E. Tipton, vice president for New Orleans; John D. Waterman, vice president for Mobile; John A. Merritt, vice president for Pensacola; Philip Shore, vice president for Tampa; F. H. Hueble, treasurer and H. J. Devereux, secretary. Galveston was not represented at the annual meeting and a vice president for that port will be elected at the next meeting.

* * *

A new steamboat service between New Orleans and the Bayou Teche towns, including New Iberia, Morgan City, Jeanerette and Patterson has been inaugurated by the Consolidated Co., Inc., chain store operators of Plaquemine, La. The LORAINE K, a 350-ton steamboat, will be used in the service.

* * *

John Quinn, director of the gulf division of the shipping board with headquarters at New Orleans, resigned effective September first to become general manager for S. Sgitcovich & Co., Galveston steamship operators. George J. Santa Cruz, formerly connected with the Savannah office, has been mentioned as Mr. Quinn's probable successor.

Up and Down the Pacific Coast

THE Admiral line announces that plans have been drawn for two new passenger and freight liners, to cost approximately $2,000,000 each, and to be constructed immediately. They will be placed in service between California and Puget Sound ports. Efforts were made to find already constructed suitable vessels for this service, but, as these could not be found, decision to build is announced. The name of the builder has not been made public. When plans for the ships were first broached, about one year ago, it was estimated that the ships would cost $3,000,000 each, but now it is estimated that the same plans can be carried out for a maximum expenditure of $4,000,000 for both vessels.

* * *

The Pacific Mail Steamship Co. steamer, SAN JOSE, which went ashore early in August on San Roque island, off the Lower California coast, has been abandoned. The cargo was removed, and the wrecking schooner HOMER succeeded in saving some of the steamer's equipment, but the loss is expected to reach about $500,000. All the passengers, the crew and captain were saved and taken on board the freighter GRIFFDU to San Francisco. The SAN JOSE was bound from Mexican ports to San Francisco when she went aground.

* * *

Oakland is deepening and widening the channel into the harbor to meet Lloyd's requirements for insurance and registry.

* * *

The Western Terminal Co., a California corporation, has been formed at San Francisco by L. J. Fahy and N. S. McNulty, to do a general stevedoring, checking, freight handling and forwarding business. The new organization has offices at 363 Embarcadero.

* * *

A 10 per cent wage reduction instituted by all the shipyards on San Francisco bay at the beginning of August has been accepted by the men, with the exception of about 30 pattern-makers, who walked out, but whose places were filled immediately. No protest was made by the other workers.

* * *

The Six Minute Ferry Co., San Francisco, has let contracts to the Bethlehem Shipbuilding Co., San Francisco, for the construction of three all-steel ferry boats, to cost approximately $1,000,000. They will be placed in service across San Francisco bay, between San Francisco and Oakland. Each will have a carrying capacity of 1500 persons and eight automobiles.

* * *

The Pacific Mail Steamship Co. has temporarily suspended its 'round-the-world steamship service, and is conducting a survey to decide whether to return to the government the three shipping board freighters it still has of the eight it formerly operated.

* * *

Growth of the Osaka Shosen Kaisha, a Japanese steamship line, is shown in a report recently issued, covering, in brief the history of the company since its organization in 1884, when it had a capital of 1,200,000 yen and a fleet of 17,000 tons. Today, the capital is 100,000,000 yen, and the fleet totals 443,000 gross tons. The line has 50 regular services in various trades. During 1920, the company's cargo business was four times greater than its passenger trade, though the net earnings fell from 44,584,335 yen in 1919, to 22,462,891 yen in 1920.

* * *

The program of the Emergency Fleet corporation on the Pacific coast will come to an end Thanksgiving day, with a celebration in many of the yards in which its ships were built, according to announcement at San Francisco at the end of August. The last vessel to be built in the San Francisco district was the LUBRICO, which was turned over to the shipping board early in August. Two more are being completed at a San Pedro yard, and these will be the last. Several shipping board vessels on the Pacific coast are to be sent to the Atlantic before the new year.

* * *

The China Mail Steamship Co. is inaugurating a test case before the federal courts to determine its right to carry passengers between two ports of the United States. The government holds that, since the majority of the stock in this company is owned by foreigners, it can not carry passengers between ports of this country, but the company contends that, as two of its steamers, CHINA and NANKING, were built in the United States and are of American registry, they, at least, can carry such passengers. With the consent of the customs officials, the China Mail company is carrying 25 passengers from San Francisco to Hawaiian ports, on board the liner NANKING, and after their delivery to those ports, will stand suit to determine its position under the law. Several other steamship lines are affected by this law, and all of them are watching closely the results to the China Mail.

* * *

The American-Hawaiian Steamship Co. announces the extension of its service into weekly schedule from New York, Boston and Philadelphia, beginning with the departure of the steamer ARIZONIAN from San Francisco for the Atlantic coast, Aug. 24. Fortnightly service from Pacific coast ports to ports of the United Kingdom and continental Europe will be established with the departure of the ALASKAN from San Francisco, early in October.

* * *

The Los Angeles Steamship Co.'s rebuilt flagship, HARVARD, recently rehabilitated at a cost of approximately $1,000,000, was given a noisy welcome when she entered San Francisco harbor for the first time since the war. With her sister ship, YALE, the HARVARD is the finest and best-equipped vessel ever engaged in coastwise passenger traffic in American waters.

* * *

The weather bureau is preparing to issue daily weather maps for the Pacific ocean, similar to those now issued for the Atlantic.

* * *

Shippers and forwarding agents of the San Francisco bay region will be enabled to present and settle claims for $70,000 loss of goods against the shipping board, now that the board has abolished the clause which limits loss to $100 per case. Announcement of this change of policy was received by A. T. White, president of the Central California Traffic association from United States Senator Samuel M. Shortridge, recently. The valuation clause has been eliminated from bills of lading used in connection with shipping board vessels in intercoastal trade and

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claims are to be settled on the invoice or declared valuation. This should induce California merchants to bring in their goods, whenever possible, in American, rather than foreign, bottoms.

* * *

The newest of Uncle Sam's battleships, the CALIFORNIA, was put into commission at Mare Island, Cal., Aug. 10, and taken immediately to the Hunters Point drydock, at San Francisco, where her new steam-turbine-electric drive power plant was installed. She then went out for her trial trip and for target practice at Magdalena bay. Nine dreadnaughts and ten destroyers greeted her in San Francisco bay when she came out of drydock, the largest fleet seen in that bay for some years. The 1400 men on the CALIFORNIA are all Californians.

* * *

The new charter of the combined city of Oakland and county of Alameda, on which the people will vote this fall, provides for a county harbor commission of five men, to have charge of the ports throughout the country, to be elected every two years, and to serve without pay.

* * *

The Canadian Government Merchant Marine, Ltd., owner of the steamer CANADIAN IMPORTER, which became waterlogged and foundered at sea, 623 miles southwest of the Columbia river, Aug. 19, announces that the steamer is a total loss. She was enroute from Vancouver to Auckland, with a cargo of lumber and miscellaneous freight.

* * *

The marine railway being built at the Hanlon Shipbuilding Co.'s plant in Oakland, Cal., will be ready for service Oct. 1. Work on the ways started at the beginning of the year, and they are among the best and most completely equipped on the Pacific coast.

* * *

Following the closing of the shipping board's school of engineering at Berkeley, Cal., the sea service bureau has ordered all navigation schools to be discontinued at the close of the present term. The school in the San Francisco ferry building, under Capt. J. W. Jory, closed Sept. 15.

* * *

The bark MOSHULA, formerly a German raider, captured in the Pacific during the war, was sold at auction in San Francisco, in August, to James Tyson, president of the Charles Nelson company, for $29,500. The shipping board holds a mortgage of $204,000 against the little vessel. It was sold to satisfy the crew's lien of $15,000. The ship is of 2911 net tons, and was formerly the German ship KURT.

* * *

The CHILLICOTHE, 1726 net tons, also a German boat but interned in San Francisco during the war, was sold at auction to Capt. John F. Blaine for $25,000.

* * *

Fifteen employes in the controlling division of the San Francisco offices of the shipping board were dropped from the payroll Sept. 1, as the first move in curtailing expenses. The employes were given wages up to Sept. 15, and a saving of $35,000 annually was effected by their dismissal. As soon as the bare-boat charter basis goes into effect, a further reduction will be made.

* * *

The Pacific Mail liner EMPIRE STATE, made a record run from Baltimore to San Francisco in August, covering the distance in 16 days, 1 hour and 20 minutes. The EMPIRE STATE is of 21,000 tons displacement, and has been put in the Orient service of the Pacific Mail Steamship Co.

* * *

The Union Iron Works, San Francisco, awarded the contract for repairs and alterations on the liner GOLDEN STATE, on a bid of $91,600, the lowest received by the shipping board, owner of the vessel, which is operated by the Pacific Mail Steamship Co. The work was completed Aug. 31.

* * *

First shipment of California flour to the Orient in ten years, went out of San Francisco on the Toyo Kisen Kaisha liner, SHINO MARU, at the end of August. The shipment consisted of 200,000 pounds of flour, brought on the river steamer J. D. PETERS, from the mills at Stockton, Cal.

* * *

With the delivery Sept. 15, of three vessels by the Moore Shipbuilding Co.'s plant at Oakland, Cal., building activity at that plant came to an end, according to George S. Armes, general manager of the corporation. This delivery rounds out the number of hulls constructed by the Moore plant during and since the war period to 65. The plant will continue as a drydock and repair yard, and now has seven steamers in drydock for repairs. The three ships delivered Sept. 15 were the Southern Pacific tanker TAMIAHUA, the Vacuum Oil Co. tanker BIRKENHEAD, and the Standard Oil motorship HARPER.

* * *

Shipping interests at Portland, Oreg., have inaugurated a campaign for a deeper and wider channel from the Oregon metropolis to the sea. The adverse report of the war department to a channel 35 feet deep and 500 feet wide and declaring for a project comprising a channel 300 feet wide and a minimum depth of 30 feet is not satisfactory and Portland interests are determined to fight for the larger waterway in view of the large ships now using the Columbia river.

* * *

Silk shipments through Seattle during 1921 will exceed the record of 1919 if the present movement continues. In 1919, that port made a silk record when 16,040 tons of raw and manufactured silk were landed. During the first half of 1921 the imports of silk at Seattle were 8072 tons and it is likely that the present year will establish a new high record. The imports during all of 1920 amounted to 8948 tons.

* * *

Beginning in October, the American-Hawaiian Steamship Co., with the United American lines as managing agents, will establish direct fortnightly service between the north Pacific, the United Kingdom and northern Europe. The company will use its own tonnage in this new service and coincidentally it has announced that hereafter it will maintain weekly service in the intercoastal route.

* * *

Prince Axel of Denmark was recently at north Pacific ports as master of the Danish motorship ASIA. The royal navigator is serving three years in the merchant marine and while here he established a record in getting smart dispatch for his command. Prince Axel featured his visit to Seattle by purchasing stock in the Universal Shipping & Trading Co., of which his old school friend, H. H. Hammer, is president.

* * *

The Isthmian steamer CHARLTON HALL has arrived at Seward, Alaska, with 5400 tons of steel rails and 375 tons of railway equipment for use in completing the government railroad in Alaska. The cargo was loaded at Mobile, Ala.

* * *

After a long period of idleness at San Francisco, the government steamer CELESTIAL is loading grain at Portland, Oreg., for Great Britain. The CELESTIAL is the first vessel built in a Chinese yard for the shipping board but since her delivery on the west coast she has been idle.

* * *

H. F. Alexander, president of the Pacific Steamship Co., admitted recently that his company had submitted an offer to purchase the steamers GREAT NORTHERN and NORTHERN PACIFIC. However, the government refused to sell the fast liners. Mr. Alexander added that because of the present high price of tonnage it may be some time before the Admiral line increases its fleet. The company may build when conditions are considered more favorable.

* * *

The channel at the mouth of the Columbia river, where the bar formerly menaced shipping, has cut its way three feet deeper over a width of 4000 feet until now there is a depth of 43 feet at mean low water.

* * *

Announcement is made that through rates on class and commodity goods have been established from St. Louis to Pacific coast ports, applying by the Mississippi-Warrior river service and the Pacific-Caribbean-Gulf line. The rates are approximately 73½ per cent of the corresponding all rail rates.

* * *

Fifteen days from London to the Panama canal and ten days from Balboa to San Pedro is the new steaming record established by the Holland-American freighter MOERDYK.

* * *

Seattle's waterborne commerce during July, including foreign and domestic imports and exports, showed an increase of $5,000,000 compared with June. Total imports, foreign and domestic during July, registered a gain of $1,000,000 compared with the same month in 1920.

* * *

For the purpose of restocking government experiment stations in Japan, 175 head of sheep and a consignment of cattle were recently shipped from Seattle to the Far East. The sheep and cattle are blooded Canadian stock.

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Marine Business Statistics Condensed

Soo Canal Report

The total movement of freight through the Soo canal in August was 7,497,876 net tons, a decrease of 640,707 net tons, when compared with the total movement of 8,138,583 net tons in July. When compared with the shipments for August of last year, which totaled 12,425,290 tons, a decrease of 4,927,414 net tons is shown. The tonnage comparison figures for the past seven years follow:

	Net tons
August, 1921	7,497,876
August, 1920	12,425,290
August, 1919	6,609,961
August, 1918	12,789,801
August, 1917	13,967,108
August, 1916	14,031,262
August, 1915	10,540,781

Of the total freight carried in August, 7,276,290 tons were handled through the United States canal, while 221,586 tons passed through the Canadian canal.

The following tabulation gives the figures in detail for 1921 and 1920:

	To Sept. 1 1921	To Sept. 1 1920
EASTBOUND		
Lumber, M. ft. B. M...	135,662	125,254
Flour, barrels	4,450,500	3,950,902
Wheat, bushels	49,631,072	39,099,711
Grain, bushels	52,347,014	26,439,256
Copper, net tons.....	11,151	27,718
Iron ore, net tons.....	15,381,861	33,573,707
Pig iron, net tons.....	526	212
Stone, net tons.....	15,510	39,825
Gen'l mer., net tons..	38,168	34,474
Passengers, number....	27,259	28,283
WESTBOUND		
Coal, soft, net tons.....	9,774,892	5,376,364
Coal, hard, net tons.....	1,506,439	1,124,860
Iron ore, net tons.....	.....	73,083
Mid. iron and steel, net tons	16,434	48,313
Salt, net tons	29,267	60,901
Oil, net tons	237,255	207,658
Stone, net tons	278,469	295,647
Gen'l merch., net tons.	291,078	302,163
Passengers, number ...	28,549	29,825
SUMMARY		
Vessel passages, number.	7,646	11,007
Regist'd tonnage, net..	19,116,015	33,318,627
Freight:		
Eastbound, net tons...	18,694,295	36,120,218
Westbound, net tons ...	12,133,834	7,488,989
Total freight, net tons.	30,828,129	43,609,207

Lake Erie Receipts

Out of a total of 4,329,158 tons shipped from upper lake ports in August, Lake Erie ports received 3,185,303 tons, as shown by figures compiled by MARINE REVIEW. The balance on dock Sept. 1 was 9,285,708 tons against 8,554,455 tons on Sept. 1, 1920. Detailed figures are:

Port	Gross tons
Buffalo and Port Colborne.....	296,427
Erie	95,813
Conneaut	1,087,287
Ashtabula	384,553
Fairport	276,602
Cleveland	471,836
Lorain	325,535
Huron	107,273
Toledo	69,454
Detroit	70,523
Total	3,185,303

Cotton-export business at Port Houston, Tex., during the month of August represented an increase of more than 100 per cent over business for the corresponding month of last year. Exports this year were 26,815 bales as compared with 11,435 bales a year ago. During August, 1921, three vessels bearing cotton cargoes left Port Houston for foreign ports, while in August, 1920, only one cotton boat cleared the port.

August Ore Shipments

Shipments of iron ore from the Lake Superior district during August totaled 4,329,158 tons. Comparing the figures with those of August, 1920, when shipments were 9,270,763 tons, a decrease of 4,941,605 tons is shown. Total shipments to Sept. 1 are 14,748,072 tons. Compared with the figures for the corresponding period of last year, 35,349,874 tons, a decrease of 20,601,802 tons is shown. Detailed shipments by ports are:

Port	Aug., 1921	To Sept. 1, 1921
Escanaba	309,111	758,173
Marquette	129,691	263,105
Ashland	468,283	1,429,308
Superior	917,693	3,508,928
Duluth	1,833,247	6,472,640
Two Harbors	671,133	2,315,918
Total	4,329,158	14,748,072
1921 decrease	4,941,605	20,601,802

Lake Michigan Receipts

Receipts of ore at Lake Michigan ports for August were 1,068,534 gross tons, as shown in the following record by ports:

Port	Gross tons
South Chicago, Ill.	476,263
East Jordan, Mich.	.....
Boyne City, Mich.....	.....
Milwaukee	.....
Indiana Harbor, Ind.	99,801
Gary, Ind.	492,470
Total 1,068,534	

Pittsburgh Traffic Lower

A loss of nearly 80,000 tons in the traffic of the Pittsburgh river district is reported for July by the United States engineers office at Pittsburgh. The total for the month was 1,619,994 tons as compared with 1,700,151 tons in June. The July aggregate was made up as follows:

Commodity	Allegheny river	Monongahela river	Ohio river
Coal	6,720	907,303	38,375
Coke	....	2,665	....
Gasoline	2,100	1,340	1,200
Gravel 155,458		80,000	36,934
Sand 177,712		104,825	97,465
Unclassified	790	2,062	1,550
Packet cargo.....	....	.....	3,495
Total 342,780		1,098,195	179,019

Use of Hydrophone

(*Concluded from page 468*)

respect to the line of receivers, there is a definite adjustment of the contact points which will bring the sound into focus, and, as a result, the adjustment of the contact points required to bring any sound into focus gives a definite direction indication.

As explained in the first article of this series, the process of bringing the currents from the several receivers into phase is called compensation and any device for accomplishing this is called a compensator. Fig. 3 gives a front view of the so-called AE-2 electrical compensator. The small lever, marked *L*, operates a switch whereby the receivers of either the port or starboard line can be connected through the circuits of the compensator. The hand wheel operates a rotating switch, the design of which is such that it controls the movable contact points along the several retardation lines in such a way as to bring the currents from the several receivers produced by sound from any desired direction into focus. This hand wheel carries a dial provided with three separate scales. A portion of these scales can be seen through the three openings of the cover plate. The outer scale gives directions off the starboard side of the vessel; the lower scale gives directions off the port side; and the center scale is calibrated to give depth.

This hydrophone is used for detecting and determining the direction of submarine sounds. To operate the device successfully requires comparatively little practice. It has been found in service that a person of ordinary intelligence can learn to operate the device in about one hour. To determine the direction of a sound, the operator merely turns the hand wheel of the compensator until the sound is binaurally centered. This operation requires only a few seconds. He then listens to the sound on both the starboard and port line of receivers and reads the direction from the scale corresponding to the line of receivers giving the loudest response. This whole procedure, which usually requires less than a minute, results in determining the direction of the sound to within from two to five degrees, while an experienced operator can determine directions within from one to two degrees error.

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Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

CLEARANCES in ports of the United States in August totaled less than in July while entrances in the main were greater. Although the entrances in New York aggregated a larger net tonnage during August than for any month this year, the clearances at the port showed the lowest record for the year. This month showed a slowing up in business and the figures undoubtedly include a number of ships which have sought refuge in the harbor during the slack period.

Traffic through the port of Philadelphia showed no improvement during August. Not only were the clearances slightly smaller in net tonnage than the month previous, but the ships clearing in ballast increased. About a third of the ships left the port in ballast during the month. During this month, however, the foreign entrances and clearances in ballast exceeded the ballast movement of American ships.

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921...	478	1,583,991	390	1,300,897
July	394	1,456,304	403	1,423,109
June	408	1,368,334	419	1,425,649
May	425	1,454,033	366	1,328,643
April	410	1,453,056	438	1,509,353
March	455	1,574,526	448	1,539,885
February	424	1,407,133	374	1,315,556
January	455	1,437,725	414	1,433,564
December, 1920.	516	1,732,485	518	1,802,929
November	495	1,741,786	482	1,691,683
October	526	1,763,904	514	1,719,103
September	506	1,728,266	493	1,574,228
August	537	1,634,719	499	1,649,416

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921...	84	208,961	61	144,029
July	75	178,925	61	148,674
June	71	176,968	74	214,524
May	110	295,617	70	178,464
April	105	255,249	79	209,854
March	102	306,512	87	242,606
February	104	285,369	75	221,402
January	84	250,233	68	217,281
December, 1920.	116	340,133	112	235,821
November	126	338,562	123	350,385
October	119	328,074	165	465,800
September	144	385,676	153	467,357
August	153	377,695	156	438,230

New Orleans

(Exclusive of domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921.	210	478,941	194	482,451
July	157	371,379	176	410,749
June	172	440,527	195	479,495
May	166	410,047	145	354,539
April	205	515,287	210	530,283
March	201	458,079	202	452,385
February	178	436,045	200	453,899
January	168	399,903	183	443,303
Dec., 1920...	202	520,346	212	507,810
November ..	185	428,650	173	451,553
October	181	416,966	228	545,352
September ..	183	453,177	202	506,194
August	201	470,168	186	504,741

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1921.....	140	410,926	238	728,458
May	129	398,042	201	601,675
April	57	179,852	125	375,044
March	47	143,487	88	260,053
February	55	160,494	108	327,241
January	84	251,499	163	442,657
December, 1920	151	367,936	202	505,690
November	155	376,515	244	559,128
October	216	509,154	305	722,121
September	156	377,717	272	666,466
August	137	345,968	275	700,759
July	168	410,980	280	725,183
June	189	445,371	255	669,083

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1921.....	15	15,723	12	12,749
May	4	8,324	10	8,885
April	17	54,804	19	64,310
March	24	75,529	25	80,107
February	20	66,422	21	73,581
January	34	93,933	28	86,559
December, 1920.	36	96,281	31	107,567
November	37	61,804	16	23,282
October	15	22,240	13	19,862
September	14	29,993	5	12,661
August	31	42,464	14	8,626
July	19	27,314	9	9,022
June	29	45,670	12	34,886

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921 ..	100	280,687	63	102,032
July	98	178,403	81	115,503
June	138	211,667	100	119,945
May	122	190,148	87	98,008
April	101	217,080	71	133,952
March	99	306,454	49	113,184
February	74	260,502	46	119,847
January	72	175,052	50	125,904
December, 1920.	66	178,656	51	128,439
November	79	193,433	52	107,112
October	82	182,028	62	116,007
September	99	210,496	75	123,045
August	133	235,706	83	124,643

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921 ..	57	108,936	48	83,486
July	67	156,801	58	101,850
June	53	101,592	51	92,800
May	43	67,627	45	71,756
April	96	249,996	76	150,776
March	79	146,798	56	82,898
February	58	105,040	47	89,647
January	68	94,273	63	78,109
December, 1920.	97	147,575	74	122,293
November	73	91,814	54	74,252
October	64	98,107	81	128,540
September	55	102,589	60	111,595
August	77	118,308	71	127,201

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
May, 1921.....	5	9,507	16	36,377
April	17	40,418	12	25,543
March	13	19,924	14	29,618
February	9	14,493	15	32,475
January	11	21,591	20	38,179
December, 1920.	22	45,085	26	36,110
November	32	61,216	18	28,108
October	22	35,837	33	55,632
September	21	43,316	21	46,881
August	15	22,562	16	31,695
July	16	29,561	14	23,679
June	20	41,844	21	39,280
May	16	29,270	17	36,425

San Francisco

(Inclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921...	464	770,980	457	788,238
July	275	699,092	335	676,340
June	194	474,948	211	543,629
May	271	594,409	164	426,255
April	377	607,559	452	703,717
March	335	645,435	341	611,575
February	305	594,636	297	548,103
January	356	585,689	330	566,201
December, 1920.	388	606,666	359	561,188
November	393	640,474	399	633,274
October	431	641,970	421	639,323
September	399	549,468	391	566,048
August	427	653,372	401	604,069

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921...	65	69,911	59	66,223
July	85	89,901	86	87,449
June	105	104,326	104	101,494
May	100	104,326	104	103,571
April	115	117,586	111	114,748
March	112	107,736	108	107,083
February	124	118,950	120	119,241
January	128	146,679	127	142,474
December, 1920.	121	102,611	121	97,733
November	103	90,374	98	82,126
October	84	92,944	79	80,681
September	97	87,017	95	89,030
August	98	91,442	102	87,420

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1921...	90	251,499	87	239,482
July	116	349,379	123	365,666
June	118	359,201	133	413,410
May	109	341,731	112	341,381
April	114	320,195	119	351,950
March	111	320,238	107	316,536
February	112	380,602	93	292,881
January	131	401,511	112	344,480
	——To foreign ports direct——			
December, 1920	92	264,142	113	329,320
November	109	316,743	145	425,493
October	134	372,463	188	545,974
September	120	353,374	143	409,839
August	103	282,370	169	473,160

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1921.....	27	100,411	31	100,580
May	35	98,885	26	77,036
April	32	119,049	28	71,958
March	39	99,455	33	94,380
February	74	97,252	60	93,544
January	60	111,882	86	64,844
December, 1920.	74	60,333	56	61,211
November	69	89,143	79	91,763
October	65	72,101	85	104,304
September	27	70,989	34	77,330
August	20	44,580	34	89,180
July	15	40,218	23	62,737
June	28	41,275	23	44,289

Seattle

Month	Deep sea arrivals No. ships	Net tonnage	Deep sea departures No. ships	Net tonnage
July, 1921	158	450,050	159	436,884
June	100	331,505	110	341,278
May	106	299,777	99	282,583
April	143	339,192	163	370,070
March	149	372,824	144	369,568
February	103	295,144	101	272,136
January	131	312,072	134	344,877
December, 1920.	205	323,744	186	302,051
November	256	348,452	228	337,890
October	359	347,412	314	366,669
September	422	380,582	323	345,535
August	438	371,148	393	368,327
July	417	441,626	461	444,607

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Equipment Used Afloat, Ashore

Electric Rivet Heater—Cutting and Welding Torch —Stockless Anchor—Coal Trimmer

A NEW type of rivet heater, suitable for work in shipyards structural steel work, etc., has recently been developed by the General Electric Co., Schenectady, N. Y. The new heater is designed to provide entire safety and is adaptable for both intermittent and steady operation.

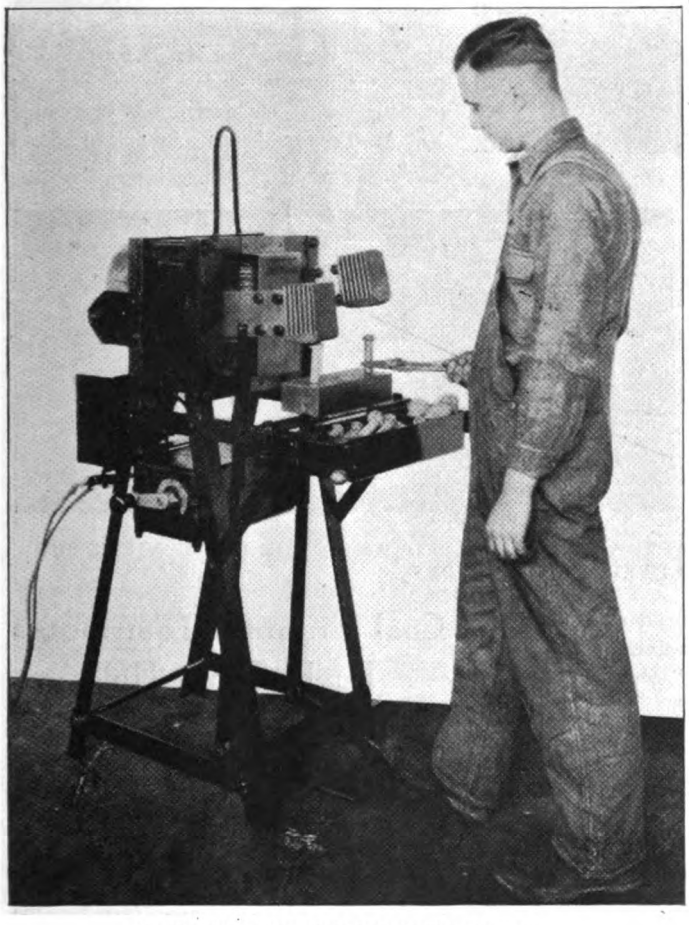
The heater consists of an air-cooled transformer, with a single turn short circuited secondary, in which the rivets to be heated form a part of the secondary circuit. The primary winding is designed for operation on 220, 440 or 550-volt, single phase circuits of 40, 50 or 60 cycles. Taps are brought out from the primary winding to a drum controller, so that six different voltages can be obtained on the secondary. This makes adjustment for various sizes of rivets, or rates of heating simply a matter of setting the handle on the drum controller.

The secondary coil is divided into two upper electrodes moved by pedals, and a cold rolled copper electrode block directly under them. The two rivets to be heated are placed on the lower block, and the movable electrodes lowered on them, thus completing the circuit. Since the resistance of the rivets varies from 6 to 50 times that of the copper, according to temperature, most of the electrical energy in the secondary is dissipated in the form of heat in the rivets.

DIAMETER OF RIVET IN INCHES

Length under the head in inches	¼	⅜	½	⅝	¾	⅞	1	1¼
1	16	10.6	17.6	..	..	..	..	..
2	28	25	24	37	52.5	56	..	..
3	38	38	36	41	60	69	85	100
4	..	46	50	55.6	68	95	94	140
5	..	50	56	72	84	116	132	190

The accompanying table gives the approximate time in seconds required to heat one rivet. Two rivets are heated at once so that the output of the heater is two rivets for each unit of time as shown by this table. The tests from which these figures were obtained were run with clean rivets. If rivets are covered with rust or scale, or if the electrode block is dirty, heating will be somewhat slower, because the electrical contact will not be as good. It often happens, especially in building construction that the demand for rivets is intermittent, for various reasons. In order to take care of such a condition this heater is provided with a switch which operates to disconnect one side of the primary from the line.



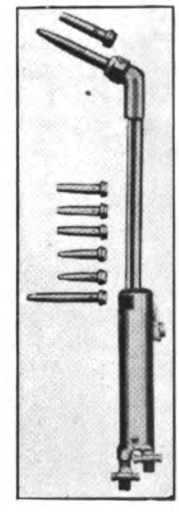
IMPROVED ELECTRIC RIVET HEATER

The switch is opened by means of a lever convenient to the left hand of the operator which enables him to use his right hand at the same time in the process of heating the rivets.

The heater is rated 15 kilowatts, 90 per cent power factor continuously. The input can be increased to 17.5 kilowatts for two hours or 20 kilowatts for one hour without exceeding the rated temperature rise of 550 degrees Cent. The heater weighs about 600 pounds and is provided with a bail for lifting, or if desired, wheels so that is can be rolled from place to place.

Torch Combines Cutting and Welding

Contracts for oxy-acetylene welding and cutting equipment recently were placed by the Baltimore & Ohio railroad and the Western Maryland railroad with the Alexander Milburn Co., Baltimore. The contracts include a number of combination welding and cutting torches. The combination torch, shown in the accompanying illustration, is designed to be economical, a feature which appeals to the railroads under their present conservative policy. Competitive tests are said to have shown a saving in original cost as compared with two single purpose torches and a saving of labor and gas in changing from welding to cutting, together with a decided saving in gas consumption over an extended period of operation. The Milburn torch is transformed instantly from a cutter to a welder by a change of tip. All mixing occurs in the tip, a principle specified by government engineers. As hose connections are not disturbed, no gas is wasted.



In the welding tip, the oxygen stream and acetylene stream under equal pressure, are broken up into multiple jets, and these jets are paired, one of oxygen and one of acetylene

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to form the first mixing. These multiple jets of oxy-acetylene gas then enter a conical expansion chamber, forming a vortex, before they converge in a single passage leading to the flame end of the tip. This mixing of gases under equal pressure insures a neutral flame.

The cutting tips are made in one piece of special bronze composition with high percentage of copper to withstand the heat of the cutting flame. The seats of the tip are flat, with annualar grooves coinciding with those in the head, the gas passages being drilled in the annular grooves or rings. The rings separate the gases. An outer protecting ridge prevents injury to the tip seat in rough handling. With the flat seat of the tip, sufficient play is given for lateral expansion of the torch head and tip under the locking nut without cracking or distorting the head. The flat seat is easily refaced with a hand burnishing tool, and new tips do not require "grinding". The oxygen orifices pass directly through the tip, practically in parallel. The acetylene drilling enters the oxygen passage at an angle of 30 degrees from the outer ring, and is accessible for cleaning.

New Lake Marine Office

The Babcock & Wilcox Co., 85 Liberty street, New York, manufacturer of water-tube boilers for land and marine service, has opened a marine office in the Guardian building, Cleveland, where an office for land boilers was already located. The marine representative will be John Coleman, who has been connected with the Babcock & Wilcox Co. for more than 20 years, most of that time being superintendent of the marine erection department. Before coming with the boiler company, Mr. Coleman was for a number of years an engineer on lake steamers and has a wide acquaintance in that territory. The selection of Mr. Coleman was made to put the office in charge of an expert thoroughly familiar with boiler problems and with lake conditions in particular.

Lock Grip Stockless Anchor Improves Old Style

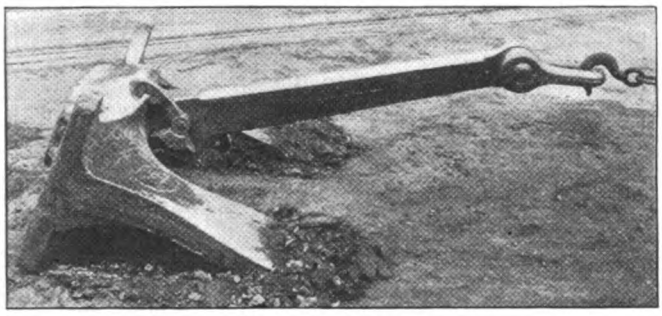
The stockless anchor possesses decided advantages over the old style or stock type anchor, but a valuable feature possessed by the old fashioned type is thereby sacrificed. In the latter, the weight of the shank, stock and chain helps to hold the point of the fluke in contact with the ground. In the stockless type as it is necessary to pivot the shank to the flukes, the weight of the shank and chain does not help to hold the point of the flukes in contact with the ground. As a result, the stockless anchor does not take hold comparatively quickly. The purpose of the device, shown in the accompanying illustration is to provide the stockless anchor with what might be termed the hook action possessed by the older type. This anchor is manufactured by the American Steel Foundries, Chicago.

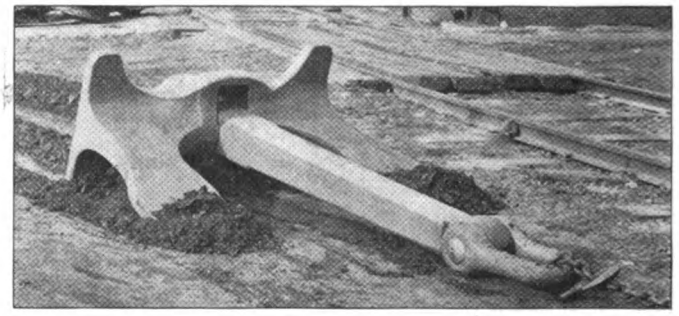
To accomplish this, a device was incorporated which would automatically lock the shank of the stockless anchor to the flukes when the anchor was in holding position and automatically release the flukes when the shank was in a vertical position.

The accompanying illustrations show a comparative test made with a 4000-pound stockless anchor as it is commonly designed and a 3000-pound anchor equipped with a locking device. The anchor with the locking device began to bury itself before it had been dragged more than three feet, whereas the anchor without the device was dragged 35 feet on hard ground without showing any signs of digging in.

It is pointed out that the device will not interfere with the freedom of rotation of the flukes in any position. When the shank is raised to the vertical position the pawl head is carried out of the depression on the anchor while the counterweight prevents it from dropping back into the depression until the anchor is again in holding position and the shank lowered to the horizontal. The flukes are, therefore, free to fall, as at present, either way that the direction of the pull demands.

Whenever the anchor is brought up to the ship the locking device is automatically disengaged and the flukes are free to rotate as at present. The device is designed so that the pawls will not interfere with the stowing of the anchor in the hawse-pipe. The device has been approved by the American Bureau of Shipping and Lloyd's Register of Shipping. This device was originated by A. Trevor Jones, American Steel Foundries, Chicago.





THE UPPER ILLUSTRATION IS A STOCKLESS ANCHOR EQUIPPED WITH A LOCK GRIP WHILE THE LOWER VIEWS SHOW A COMPARATIVE TEST BETWEEN TWO ANCHORS

Coal Trimmer Distributes Fuel in Ship Hold

For storing coal in portions of the hold of a ship which are inaccessible to gravity flow, a mechanical coal trimmer recently has been developed and is so devised that this result may be secured as necessity demands. The equipment consists principally of a rotating cowl and a pivoted frame carrying the

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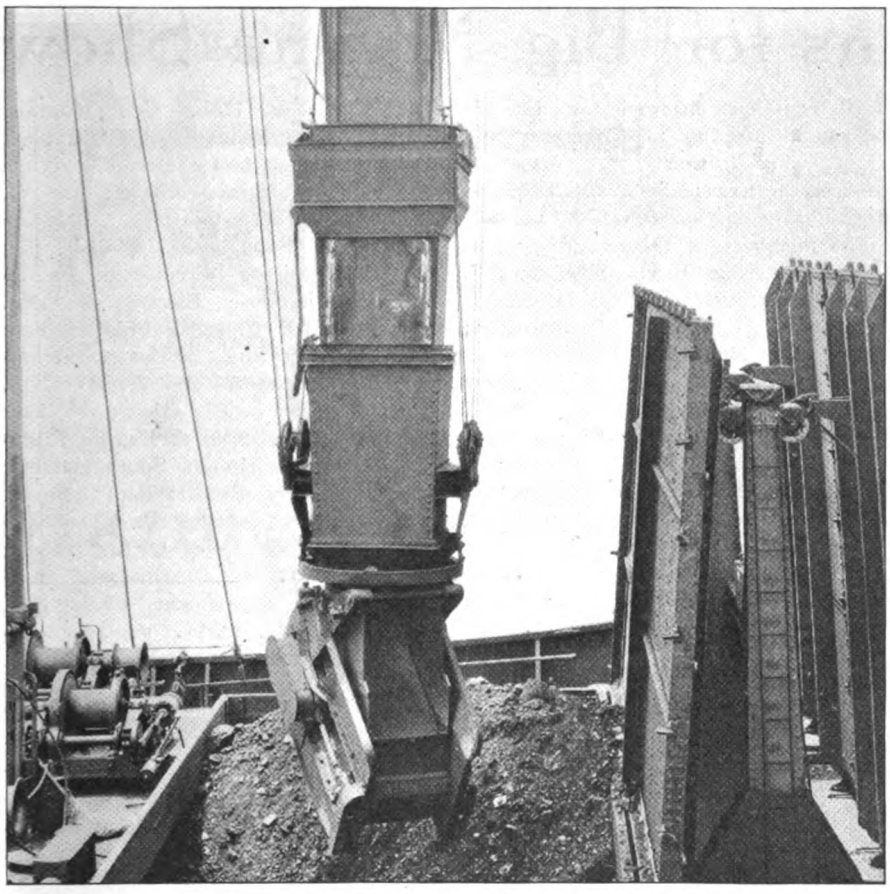


NEW TYPE OF COAL TRIMMER

trimming conveyor and driving motor. As shown by the accompanying illustrations, the cowl is divided into two sections, the upper one of which is fixed to the lower end of the telescope chute of the hopper and forms a support for the lower or rotating section.

The conveyor frame is pivoted to the upper front side of the rotating cowl and is arranged to swing about this pivot as desired. When the frame is fully extended, all of the coal leaving the cowl passes over the trimmer belt and is projected in a horizontal direction by the high speed of the belt. When the frame is retracted, the belt occupies a position at the rear of the cowl where it is not touched by the coal discharged from the cowl. Either position of the belt is quickly obtained through a double throw hand lever on the side of the conveyor frame, the power being supplied by the conveyor motor which is supported in a tight enclosure at the back of the conveyor frame. Drive to the rear belt pulley is applied by a chain drive which gives a belt speed of 2750 feet per minute. The motor is 50 horsepower.

For an even distribution horizontally, the cowl is rotated by a motor mounted on the upper section driving a pinion which meshes with a rotating gear on the lower cowl. Electric current for the motor which drives the belt is delivered by contact brushes and collector rings which surround the cowl at a point just beneath the rotating gear. These rings are of minimum diameter and are protected against damage from flying material.

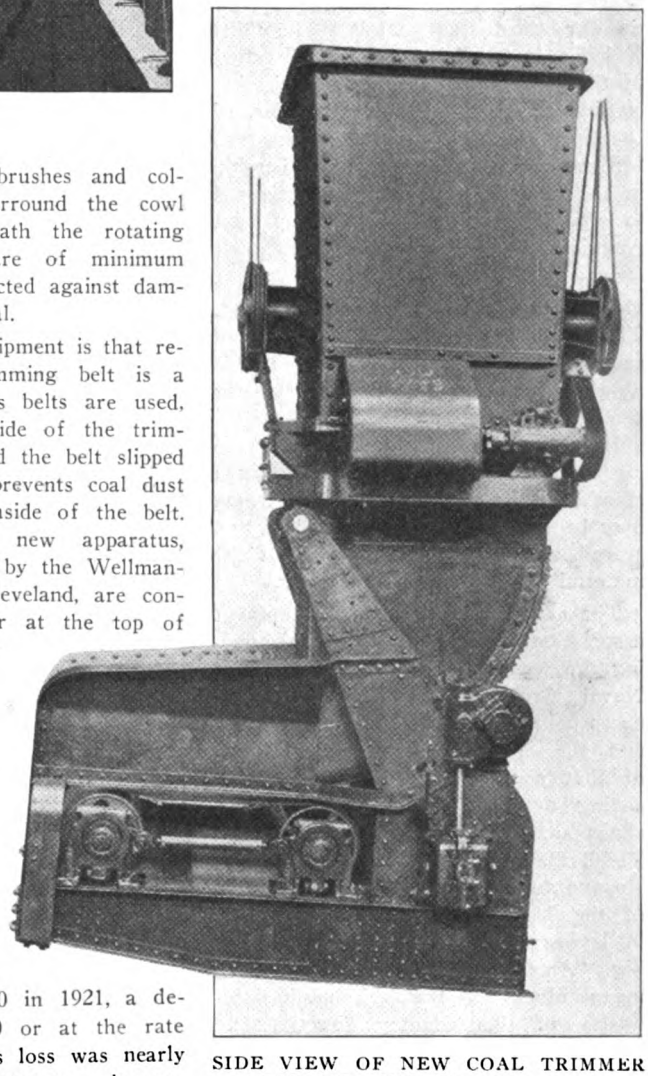
A feature of the equipment is that replacement of the trimming belt is a simple matter. Endless belts are used, the bearings on one side of the trimmer being removed and the belt slipped over. A guard plate prevents coal dust from falling on the inside of the belt. All motions of the new apparatus, which is manufactured by the Wellman-Seaver-Morgan Co., Cleveland, are controlled by the operator at the top of the telescope chute from which point other functions of the main machine are usually controlled.

The total value of the foreign trade of the United States in merchandise dropped from $13,347,000,000 in the fiscal year 1920, to $10,171,000,000 in 1921, a decrease of $3,176,000,000 or at the rate of 23.8 per cent. This loss was nearly equally divided between imports and exports. Imports dropped from $5,238,000,000 in 1920 to $3,654,000,000 in 1921, a loss of $1,584,000,000, or 30.2 per cent; while exports totaled $8,109,000,000 in 1921, against $6,516,000,000 in 1921, a decrease of $1,593,000,000 in value, but only at the rate of 19.6 per cent.

The HAWKEYE STATE, which has been transferred to Seattle to take up the sailing of the WENATCHEE, undergoing repairs, was to sail for the Orient Sept. 27. On the completion of her round trip she will be returned to San Francisco operators.

Capt. O. A. Gilbert of the Boston Ship Brokerage Co., recently purchased the American schooner CLARA A. DONNELL of 990 net tons from the Globe line, New York. During the war the schooner was in the transatlantic trade.

Repairs were recently completed on the shipping board steamship FARNAM at the Jahncke plant, New Orleans, and the vessel has been assigned to Daniel Ripley & Co., Houston, Tex.



SIDE VIEW OF NEW COAL TRIMMER SHOWING PIVOTED FRAME AND CONVEYOR

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Complete Plans for Big Marine Show

THE Marine Equipment Association of America will hold its first annual exhibit at the Central Mercantile building, New York, during the week beginning Nov. 14.

The Central Mercantile building, more familiarly known as the Greenhut building, is located on the east side of Sixth avenue, between eighteenth and nineteenth streets. For some years it was occupied by a retail dry goods store and during the war was taken over by the war department and used as a hospital for sick and wounded soldiers returned from overseas. Each floor of the building contains more than 80,000 square feet of space with a floor load of 190 pounds per square foot. The first two floors have been laid out by the Manufacturers Exhibition Co., Inc., for permanent exhibits of machinery and mechanical appliances much like the one that has existed in the Bourse building, Philadelphia, for several years. The marine show will be held on the third floor; and all exhibits will be installed under the direction of the exhibits committee of the association, of which W. M. Wampler, of the Coen Co., is chairman. Applications for space as well as for membership in the association should be addressed to the secretary, K. L. Ames Jr., American Steel Foundries, Chicago.

The by-laws of the association provide that only members may exhibit. The annual dues are $25 a year; and each exhibiting member will be charged a given price per square foot for such space as he may contract.

It is the plan of the association to lay out the exhibit spaces in given standard units of uniform design, which may be easily put up, taken down and stored, and to buy and own all of the material for use in future years.

The action of the Marine Equipment association in deciding to exhibit during the week in which the Society of Naval Architects and Marine Engineers will hold its annual convention and the appointment by the council of that society of a committee consisting of Capt. C. A. McAllister, chairman, J. Howland Gardner, W. H. Todd, H. H. Raymond and F. L. DuBosque to act with a like committee of the Marine Equipment association in laying out a joint program for a big "American Marine Week" will mean much to the shipbuilding industry of this country directly, and will also stimulate public interest in the American merchant marine. Also, the American Society of Marine Draftsmen has changed the date of its annual meeting to November and it is believed that other organizations in the marine field will decide to meet during that week.

The members of the executive committee are: New England district: E. B. Williams, manager marine department, B. F. Sturtevant Co., Boston; and F. L. Andrews, vice president, Hyde Windlass Co., Bath, Me.; New York and New Jersey district: M. L. Katzenstein, manager marine department, Worthington Pump & Machinery Corp., New York; W. M. McFarland, manager marine department, Babcock & Wilcox Co., New York; H. C. Davis, treasurer, Row & Davis Engineers, Inc., New York; and Frank Hatch, vice president, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and West Virginia district: G. W. Selby, secretary-treasurer, Marine Decking & Supply Co., Philadelphia; J. C. McQuiston, director of publicity, Westinghouse Electric & Mfg. Co.; East Pittsburgh, Pa.; William Stayton, president, Baltimore Steamship Co., Baltimore; and W. P. Smith, superintendent of sales, William Cramp & Sons Ship & Engine Building Co., Philadelphia; South Atlantic and Gulf states district: Paul Jahncke, vice president, Jahncke Dry Docks & Shipbuilding Co., New Orleans; Great Lakes district: F. C. Bradbury, manager marine department, Crane Co., Chicago; J. D. Sarles, manager marine department, Pyle-National Co., Chicago; H. L. Hibbard, manager marine department, Cutler-Hammer Mfg. Co., Milwaukee; and J. H. Redhead, assistant manager of sales, National Malleable Castings Co., Cleveland; Pacific coast district: W. M. Wampler, eastern manager, Coen Co., San Francisco and H. F. Alexander, president, Pacific Steamship Co., Seattle. The finance committee consists of W. M. McFarland, Babcock & Wilcox Co., chairman; and J. R. Tiebout Jr., W. & J. Tiebout, New York.

Business Changes

The Metals Coating Co. of America, manufacturer and distributor of the Schoop metal spraying process, by means of which metallic coatings of any kind may be sprayed onto any surface, is now in full operation at its new plant, 495-497 North Third street, Philadelphia, having removed from its former Boston and Woonsocket, R. I., locations.

* * *

The manufacturing and distributing rights of ripolin, an original Holland enamel paint, have been taken over by the Glidden Co. of Cleveland, and its affiliated companies.

* * *

The Western Electric Co. has rezoned its sales territory, establishing a new district, the Atlantic district, with R. W. Van Valkenburgh as manager. It includes the area covered by the Philadelphia and Pittsburgh houses, which was formerly a part of the western district. Headquarters will be located in Philadelphia. The new seaboard territory includes most of Pennsylvania and Maryland, Delaware, southern New Jersey and southeastern Ohio.

* * *

W. W. Van Ness, for some time connected with Davies, Turner & Co., Boston, has entered business for himself and will conduct a foreign and domestic freight forwarding business with offices at 10 High street, Boston, under the firm name of W. W. Van Ness & Co.

* * *

An office of the Reeve Shipping Co., 42 Broadway, New York, has been established at 156 Market street, Newark, N. J., which will be under the personal supervision of W. M. Armstrong of W. M. Armstrong & Co.

New Trade Publications

ANCHOR CHAIN CABLE—The story of the development of electric cast steel anchor chain cable is told in a 24-page booklet issued by the National Malleable Castings Co., Cleveland. It is well edited, artistically prepared and amply illustrated. Charts comparing wrought iron stud link anchor chain cable with the National Malleable company's product are given, the results of tests.

SHIP REPAIRS—Reprint of an article published in the Liverpool, England, *Journal of Commerce*, entitled "Keeping the World's Ships in Good Condition," is being circulated in booklet form by the Morse Dry Dock & Repair Co., Brooklyn, whose work and yards are fully described and illustrated in the article. Among the illustrations is a birdseye view of New York harbor showing the location of the Morse yards.

PIPE AND BOILER COVERING—Under the title of "Defend Your Steam," the Magnesia Association of America, 721 Bulletin building, Philadelphia, has published an 84-page book presenting a study of the cause and prevention of heat losses in the transmission of steam for power or heating purposes. It is one of the most completely illustrated books received and shows the use of heat insulation in practically all its possibilities. It is well edited and presents a strong argument for magnesia coverings.

DIESEL ENGINES—The Pacific Diesel Engine Co., Oakland, Cal., presents its specialty, Werkspoor diesel engines, in a pamphlet which illustrates and describes the product and discloses comparison between logs of a diesel tanker and a steam tanker operating on the Pacific.

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